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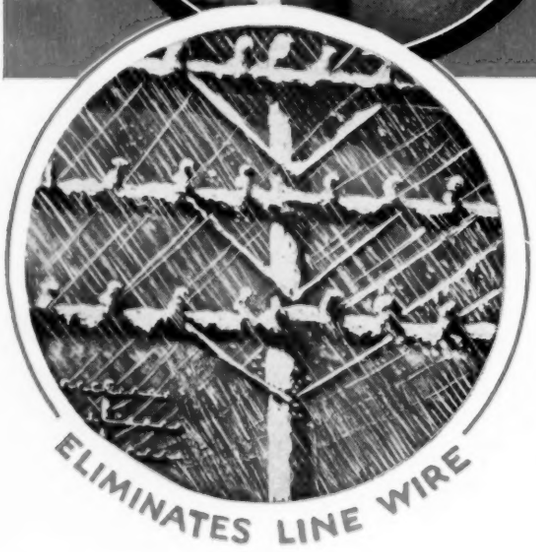
CODED TRACK CIRCUIT CONTROL

Insures Reliable Functioning of Signals . . .

Under All Weather Conditions



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What Is Wrong With Railways?

The prevailing confusion and ineptitude regarding all economic matters could not be better illustrated than by the case of the railways. The reasons and remedies for their plight are obvious to every real student of their problem who is uninfluenced by politics; and yet on every hand men pretending to be seeking a solution are running around in circles and getting nowhere because they are too selfish or timid to face facts, state them and advocate policies based on them.

The principal thing wrong with the railways is lack of traffic due to lack of production, construction and commerce. For this reason freight loadings in the first quarter of 1938 were the smallest in the first quarter of any year of the depression, excepting 1933—41 per cent smaller than in 1929; 36 per cent smaller than in 1930; 23 per cent smaller than in 1931; 2.2 per cent smaller than in 1932; 15 per cent larger than in 1933; 5 per cent smaller than in 1934; 4 per cent smaller than in 1935; 9 per cent smaller than in 1936 and 22 per cent smaller than in 1937.

Why the Railways Lack Traffic

It is almost eight and one-half years since the stock market panic of 1929. Within eight years after all the panics that started previous great depressions in this country recovery had been completed, and production, construction, commerce and traffic had attained unprecedentedly high levels. The complete failure of recovery, and the recession which has pulled the nation's business down to its present level, have been principally due to failure of investment in productive and service industries to revive on a large scale. Revival of investment has been prevented by New Deal policies such as those vastly increasing government expenditures and indebtedness, taxing undistributed profits, excessively taxing capital gains, artificially manipulating the currency, putting the government into competition with private enterprise and promoting advances of hourly wages that would have been justifiable only in a period of prosperity.

The principal thing required to solve the railroad problem is abandonment of government policies preventing revival of investment, production, commerce and traffic. Has President Roosevelt been told this by any of those he has asked to advise him regarding the railroad problem? If not, why not? Don't they know it is true? If not, they don't know much about the railroad problem. If they do know it, and haven't told him, they have been giving an example of that timidity which is the most pronounced characteristic nowadays of most men in high places in this country.

Traffic Too Small—Unit Costs Too High

The second most important thing the matter with the railways is that, *on the basis of their present volume of traffic,* their unit costs of labor, materials, fuel and taxes are too high. If we had had real recovery their freight traffic would now be larger than in 1929. With that much traffic and present rates they probably could stand present wages and other unit costs, employ many thousands more men, make purchases from the manufacturing industry adequate for the maintenance and improvement of their properties, and earn satisfactory net operating income. But that their present wages and other unit costs probably would not be too high *if their present traffic volume were as large as it should be* does not alter in the least the fact that, under existing conditions, their unit costs are too high, and should be reduced.

Table I—Railway Results, First Two Months of 1933 and 1938

	1933	1938	Increase or Decrease	Per cent Increase or Decrease
Total Operating Revenues	$438,563,738	$530,432,658	+$91,868,920	+20.9
Operating Expenses	353,013,827	448,197,751	+95,183,924	+27.0
Per cent operating exp. of total Oper. Rev.	80.5	84.5	.....	...
Taxes	43,175,527	56,264,089	+13,088,562	+30.3
Total, expenses and taxes	396,189,354	504,461,840	+108,272,486	+27.3
Per cent Oper. Exp. and Taxes of Total Oper. Rev.	90.3	95.1	.....	...
Rentals	18,655,595	21,187,423	+2,531,828	+13.6
Total, Expenses, Taxes and Rentals	414,844,949	525,649,263	+110,804,314	+26.7
Per cent of Total Oper. Revenues	94.6	99.1	.....	...
Net Railway Oper. Income	23,718,789	4,783,395	−18,935,394	−79.8
Per cent of Total Oper. Revenues	5.4	0.9	.....	...
Total Wages	220,789,931	282,544,103	+61,754,172	+28.0
Per cent of Total Oper. Revenues	50.3	53.5	.....	...
Other Operating Expenses	132,223,896	165,653,648	+33,429,752	+25.3
Per cent of Total Oper. Revenues	30.2	31.0	.....	...
Number of Employees	943,775	949,667	+5,892	+0.6
Average Wages	$233.94	$297.52	+$63.58	+27.2

The worst first quarter the railways had in the depression previous to 1938 was in 1933 during the banking crisis. Advocates and defenders of the New Deal have claimed the nation was then on the verge of a complete economic collapse from which it was saved only by New Deal measures then and subsequently

adopted. Only two months' data regarding results of railway operation in 1938 are as yet available. In Table I are given statistics for the first two months of 1933 and 1938.

The Railways in 1933 and 1938

Both freight and passenger traffic were larger, and consequently "total operating revenues"—i.e., gross earnings—were almost $92,000,000 larger in the first two months of 1938 than in the first two months of 1933. The net operating income earned, however, was $23,719,000 in 1933 and only $4,783,000 in 1938—*80 per cent smaller than in two months when New Dealers claim the country's economic system was almost gasping its last.* Operating expenses were 27 per cent, or $95,200,000 larger, of which increase $62,000,000 was due to an increase in payroll of 28 per cent. Taxes were 30 per cent, or $13,100,000 larger. Ordinarily wages are about 45 per cent of gross earnings. Wages in the first two months of 1933 were 50 per cent of gross earnings, while in 1938, they were 53½ per cent, the principal reason for the increase being that average compensation per employee for two months increased from $233.94 to $297.52, or 27 per cent. In the first two months of 1933 operating expenses, taxes and rentals were 94.6 per cent of gross earnings. In 1938 they were 99.1 per cent. In the first two months of 1933 net operating income was 5.4 per cent of gross earnings; in 1938 less than 1 per cent. It should be borne in mind, in considering these figures, that comparison of 1938 results is being made with almost the very worst operating and financial results ever reported prior to this year.

Table II.—Railway Results First Two Months 1933 and 1938 Readjusted for 1938 on Basis of Advance in Freight Rates

	1933	1938	Increase	Per cent Increase
Total Oper. Revenues.	$438,563,738	$551,173,658	$112,609,920	26.0
Operating Expenses ..	353,013,827	448,197,751	95,183,924	27.0
Per cent Oper. Expenses of Total Oper. Revenues .	80.5	81.3		
Taxes	43,175,527	56,264,089	13,088,562	30.3
Total expenses and taxes	396,189,354	504,461,840	108,272,486	27.3
Per cent Oper. Expenses and Taxes of Total Oper. Revenues	90.3	91.5		
Rentals	18,655,595	21,187,423	2,531,828	13.6
Total expenses, taxes and Rentals	414,844,949	525,649,263	110,804,314	26.7
Per cent of Total Oper. Revenues .	94.6	95.4		
Net Railway Oper. Income	23,718,789	25,524,395	1,805,606	7.6
Per cent of Total Oper. Revenues .	5.4	4.6		

Effect of Advance in Rates

Results in the first two months of 1938 would, of course, have been substantially better if the recent rate advance had been in effect. January and February always are months of relatively small traffic; but gross earnings in those months of 1938 would have been increased at least $20,000,000. Table II indicates about how the comparative results would have been changed. Gross earnings would then have been about $112,600,000 larger than in 1933 and operating expenses, taxes and rentals about $119,800,000 larger. Operating expenses, taxes and rentals were 94.6 per cent of gross earnings in 1933, and would have been 95.4 per cent in 1938. Net operating income in 1933 was $23,719,000, or 5.4 per cent of gross earnings. It would have been about $25,524,000 in 1938—more than five times as large as it actually was, but still only 4.6 per cent of gross earnings. In other words, in spite of a theoretical increase of almost 26 per cent in gross earnings, the increases of 27 per cent in operating expenses and 30 per cent in taxes would have made the margin of net operating income relatively narrower than in 1933 and at an annual rate of return on investment of less than 1 per cent.

Proposed "Subsidies" for Railways

These bad results would have been shown even if the rate advance had been in effect and in spite of the fact that the number of employees was only slightly greater than in 1933 and railway maintenance and buying were being cut to the bone.

President Roosevelt again has expressed his opposition to a reduction of wages. Labor leaders are, of course, opposed to it. The latest means proposed for dealing with the emergency has emanated from railway labor leaders and is that the government "subsidize" the railways with unsecured loans or actual gifts that will enable them to maintain employment and present wages and increase buying of equipment and materials. The policy of government loans was begun by the Hoover administration and adopted by the Roosevelt administration, and has now been continued for six years. This illustrates how long unsound government economic policies can make an "emergency" last. It has never done anything but temporary good. It has postponed bankruptcies without preventing them. It has caused temporary increases in buying which have been offset by subsequent declines. The *Railway Age* repeatedly has demonstrated that over periods of years the volume of railway buying from the manufacturing industry is determined by the amount of net operating income earned; and this has been just as true in periods when the government was loaning the railways money as in periods when it was not. It is a good illustration of present muddled thinking regarding all economic problems that while some saviors of the railroads, including Senator Wheeler, are contending the solution of their problem is the *scaling down of their indebtedness to private investors,* other saviors of them are contending that the solution is to *increase their indebtedness to the government.*

Real Subsidies Preferable to Loans

Real subsidies—that is, actual gifts to the railroads of the taxpayers' money—would be a different matter.

The government actually is subsidizing competing water transportation by paying one-half or more of its cost with the taxpayers' money. It actually is subsidizing competing highway transportation by paying a large and increasing part of its cost with the taxpayers' money. It would be merely another application of the same principle for the government to insist, as President Roosevelt does, upon the maintenance of present excessive wages, and then make actual gifts to the railways of enough of the taxpayers' money to enable them to maintain employment at these excessive wages and increase their buying. There is as much reason why the government should use the taxpayers' money to subsidize the railways for such purposes as why it should use the taxpayers' money to subsidize other industries and classes of the people as it has been doing, and still is, on a grand scale. Furthermore, real subsidies would not further injure railway stockholders by increasing the indebtedness of their properties.

But the principle and policy of subsidization are absolutely unsound, however applied and for whatever purpose. Why should the government prevent a real solution of the railroad problem by subsidizing competing carriers from taxes, by granting inadequate advances in rates and by opposing needed reductions of wages, and then give the taxpayers' money to the railways to nullify the destructive effects of its own other policies? What the railways need to pass through the present crisis, and especially for a lasting solution of their problem, is not loans or gifts of the taxpayers' money, but an increase in their net operating income due to increase of their gross earnings, or reduction of their operating expenses and taxes, or both. Anything but an increase in their net operating income will not do much temporary good. Nothing but an increase in their net operating income will do any lasting good.

Demands on Gross Earnings Must Be Balanced

In order that any business or industry may contribute to national prosperity, or even survive, there must be a reasonable balance between the demands made upon and the uses made of its gross earnings. Every industry, in order to contribute to national prosperity, must employ labor, buy materials, pay taxes and earn return upon investment. If some of the effective demands on its gross earnings are excessive it becomes unable to meet other demands on them. The most excessive effective demand now being made on railway gross earnings is that of hourly wages exceeding any ever paid in a period of prosperity.

All classes of the people should share in the national income, whether in prosperity or adversity, in proportion to their contribution to it. Measured by total national income and the national income per capita being produced, by cost of living, by their own productivity, or by the ability of the railways to pay, the present hourly wages of railway employees are excessive. It may be replied they are no higher than wages in other industries. But does the present general condition of business and employment indicate that the advances in hourly wages made in most large industries have been justifiable?

Whose Duty and Responsibility?

It may be said that the national administration is opposed to reductions. But has the administration the sole duty and responsibility of promoting recovery and prosperity? Have not business leaders, including managers of railways, and also labor leaders, their duty and responsibility to the unemployed as well as to the employed, to security owners and to the public in general? Out of any given amount of gross earnings the railways cannot pay out any more than a certain amount in total wages. Raise the average wage too much, and the inevitable effect is reduction of the number employed. The number of railway employees in the first two months of 1938 was 5,892 larger than in the first two months of 1933, but smaller than in the first two months of any other year of the depression; and it will continue to decline unless either gross earnings increase or wages are reduced. It was 627,190 smaller than in the first two months of 1929; 579,851 smaller than in 1930; 355,184 smaller than in 1931; 133,670 smaller than in 1932; 21,478 smaller than in 1934; 14,517 smaller than in 1935; 57,467 smaller than in 1936 and 135,898 smaller than in 1937. Present high hourly wages have helped to almost stop railway buying and thereby contributed to unemployment in industry. They have helped to wipe out returns to most stockholders and to threaten a largely increased mileage with bankruptcy by making it unable to earn its fixed charges. Railway managers have the same duty and responsibility as other business leaders to help restore prosperity, without which railway traffic and gross earnings cannot be adequately increased.

They have the duty and responsibility to this end, of trying intelligently and courageously to establish a fair and economically sound balance in the division of available railway gross earnings between payroll, purchases, taxes and net operating income. But railway labor leaders also have a duty and responsibility to the thousands of railway employees who have been thrown out of work, to other thousands who are being threatened with unemployment, to the industry upon which these thousands are dependent for a livelihood and to the general public; and that duty and responsibility can not be met merely by insisting that, regardless of consequences, the highest wages in history shall be maintained when the condition of the railroad industry plainly shows that it cannot afford to pay them.

Will Labor Leaders Co-operate?

When advances in wages were granted last summer and fall it was understood labor leaders would declare a "holiday" regarding "make-work" legislation, join in

revising rules causing large payments for work not done and follow other policies helpful to the railroad industry. Labor leaders have not since shown the spirit of co-operation anticipated in some quarters and recently have joined in a public statement broadcasting the old libel, more untrue now than ever, that the troubles of the railways are due to overcapitalization and financial malpractices. Labor, whether organized or unorganized, is economically and morally justified in asking and demanding a larger part of the national income when that income is increasing; but it acts contrary to its own interest and that of all other classes when it insists, in such a period of depression as the present, upon the maintenance of hourly wages and working rules that plainly increase unemployment and hinder or prevent the revival of business, which alone can cause re-employment and justify high wages.

Those who seek to solve a hard problem—or to evade it—by easy means pretend to believe the solution is in consolidations, co-ordinations and other changes of system. To effect radical changes in these ways would involve great difficulties and delays; and the savings that would be made are greatly exaggerated and would not be a solution, especially if labor leaders succeeded in causing requirements that labor which was displaced should continue to be paid.

The Results of Economic Magic

The railroad problem, like our other great economic problems, is so difficult because, for political or other selfish reasons, so many refuse to ascertain and face facts, and courageously act in accordance with them. Many of these problems already would have been solved, and the United States would now be in the midst of a period of great prosperity, instead of almost at another bottom of the depression, if the views of real economists had been widely accepted and had been courageously given effect by business men and public men. But economic magic has prevailed in government policies; those who have held positions of responsibility in business have bowed too readily to the demands and threats of labor leaders and politicians; and the large increase in investment required for recovery never occurred. In consequence, the recovery that began went into reverse, and we are back where we started being deluged with magical schemes for solving the railroad and other problems that present hard economic facts and will yield only to sound economic treatment.

The policies followed with disastrous and tragic failure for five years are still defended and advocated by those primarily responsible for them. As always in such cases, they blame everybody but themselves, attribute the failure to their opponents, and contend that the medicine which has kept the patient sick will cure him if he can be made to take enough of it. Raising hourly wages to new heights has not restored prosperity; therefore, maintain them or raise them more. Enormous and wasteful government spending has not done it; therefore, spend and waste more. Artificial inflation has not done it; therefore, inflate more. Excessive taxation and other attacks on profits have not done it; therefore, increase taxes and attack profits more. The economic and business leadership of the country, including the leadership of the railways, should sternly set its face against such policies; carry the fight against them to employees and the people; courageously try to carry out the policies that it considers in the true interest of all industries and their employees and all the people; and, if beaten, at least have the satisfaction of knowing that it has done its duty and borne its responsibility as it has seen them.

No Railroad Subsidy

In the case of the railroads a direct subsidy, even "temporarily," would be particularly unsound. What is its purpose? It is to be used, according to its sponsors, to maintain present levels of employment, present wage rates and present interest payments. But the railway workers are among the highest paid in the country. They received substantial increases in wages last year.

Last August the fourteen non-operating brotherhoods received increases estimated at $98,000,000 annually and the five railroad brotherhoods increases amounting to approximately $35,000,000 annually. But even before these increases were granted it was pointed out that the five brotherhoods were receiving annual wages averaging about $45 a week. Industrial workers in manufacturing establishments today, on the other hand, are receiving an average of only $23 a week.

Out of existing federal revenues only about one-fifth come from personal income taxes; other revenues are more indirect, and a substantial part of them come from persons of very moderate means. In principle the proposed railroad subsidy would involve taxing many people who get a small wage for the sake of maintaining a special group at a wage twice as high. And before taxpayers are asked to pay a subsidy to maintain existing interest rates on existing indebtedness, they would want to have considerably more assurance than at present that they were not in many cases being asked to pay excessive rates on top-heavy capital structures. As the President points out, a subsidy to the railroad industry would only lead to demands for similar subsidies from other private industries with no stopping place in sight.

There are many better ways for dealing with the railroad problem. Among proposals that deserve more consideration than a subsidy are an emergency freight rate increase, some scaling down of costs (including wage rates higher than the traffic will bear), easier methods of scaling down excessive capital structures, savings through consolidation and, above all, measures designed to bring a *general* business recovery.

It is the last that would give the railroads the surest and most permanent help. And most of these measures could consist merely of lifting out of the path of private enterprise some of the political obstacles that now stand in its way.

—From an Editorial in the New York Times

Rail Damage and the Relation of Locomotives Thereto

Locomotives Are Damaging Much Rail

A symposium on a problem of increasing concern in these days of higher speeds and heavy loadings

What a Locomotive Did to One Rail

RECOGNIZING the increasing demand for higher speeds in both passenger and freight service and the necessity for operating therein equipment designed for the lower speeds of the period when these locomotives and cars were built, and recognizing also the damage to rail that is resulting from the operation of this equipment at these higher speeds, the Western Railway Club of Chicago presented a program jointly with the American Railway Engineering Association on Wednesday evening, March 16, at which A. A. Miller, engineer maintenance of way, Missouri Pacific, presented the problem that is confronting maintenance of way officers today, and D. S. Ellis, chief mechanical officer, Chesapeake & Ohio-Nickel Plate-Pere Marquette Lines, described the steps which mechanical department officers are taking to control and eliminate this damage. Abstracts of these papers follow.

The Problem

By A. A. Miller*

While the problem of rail damage is by no means a new one, present day demands for speed and efforts to satisfy these demands have introduced new angles. Much of the equipment which must be used in the increased tempo of transportation was designed for much slower speeds than it is now being operated at, while the old law that the effects of speed increase as the square of the speed, has not and will not be ruled out by any changes in the Supreme Court or any other court.

Rail damage by locomotives may be classified under six general headings which, not in order of importance, are: head of rail abrasion; flow of metal in rail head; rail batter; development of transverse fissures; rail burns; surface kinks, or surface bends.

Head Abrasion

Under this heading comes the loss of metal in the rail head due to the abrasive action of the wheels. It is, of course, most marked on curves, and the sharper the curve the greater the damage. Curve wear occurs even when all flanges, on both cars and locomotives, are in normal condition. Sharp flanges on both car wheels and locomotive wheels are serious offenders and, sometimes, in extreme cases, they even pare off slivers of the rail head. I have occasionally observed such slivers having as much metal as is contained in a No. 14 wire, removed by the passage of a single wheel. More frequently, however, this form of damage is indicated by a line of particles of rust near the rail base. While sharp flanges on locomotives are less common than sharp flanges on freight equipment, the long rigid wheel bases of locomotives, together with the heavier wheel loads, are responsible for a considerable part of this form of head abrasion. Ladder tracks and turnouts of yards over which switch engines are operated are particularly likely to show this form of rail damage.

While such damage is acute where it occurs, fortunately those places where flange wear is important are relatively limited and it is feasible to care for the worst of these with rail lubricators. We have found these devices to be well worth their cost in reducing this form of damage. It may be possible that, with the further development of these devices and with their proper

* Engineer Maintenance of Way, Missouri Pacific.

installation, the life of rail on curves can be so increased as to make it comparable with that obtained on straight track.

Flow of Metal in Rail Head

This flow of metal results from the fact that the area of contact between the cylindrical or conical wheel tread and the cylindrical or flat rail head is very small, only a small fraction of an inch usually, and this small area is called upon to carry so great a load that the rail steel is stressed well beyond its elastic limit. Of course, it results that there is a certain amount of flow of the steel of the rail head and probably of the wheel also. Locomotive drivers, because of their larger diameter and hence larger area of contact with the rail, are somewhat less important in this matter of flow than the locomotive trailer wheels, particularly those of small diameter, that is, the heavily loaded single trailers. This flow of the metal of the rail head produces beads or fins which are usually found on the sides of the head of the rail after some weeks or months of traffic.

This form of damage becomes particularly important on the low rail of curves on grades on single track lines where the curve super-elevation must be a compromise between the requirements of slow speed trains uphill and high speed trains downhill. With the slower trains, more of the weight of the locomotive is carried by the low rail, thus increasing the unit pressure and the extent of over-stressing and hence the amount of this flow. This damage to the low rail of curves frequently is the factor which dictates the rail renewal on the curve. While there is no way of telling how much of this damage is done by locomotives as compared with that done by the much greater number of cars, it is reasonable to believe that the greater unit stresses produced by the locomotives account for a very considerable part of this damage.

The four-wheeled trailer, because it lessens the unit pressures on the rail, is no doubt beneficial in reducing this form of damage. Perhaps the shape of the wheel tread may be given consideration with the thought of increasing the area of contact between the wheel and the rail, thus also reducing the unit pressure and the amount of flow.

Rail Batter

In maintenance terminology, rail batter means the lowering of the surface of the top of the rail at the ends. The destruction of rail ends and of the rail joints is by far the principal cause for rail renewal and because rail renewals seriously affect tie life and costs for other maintenance items, anything that will increase the life of the rail not only reduces the cost for rail but for many other items as well.

Rail batter is another result of the flow of the metal of the rail head, caused by a heavy load on a very small area. In the case of batter, the metal flows towards the expansion gap between the rail ends. This is because the metal in the top of the rail has less lateral support on the side toward the rail end and hence it flows into the gap. The top surface is thus lowered by the amount of the metal which has flowed toward and into the gap. If there were no gap there could be no batter and this fact has been established on GEO track, where joints laid absolutely tight and which remain tight throughout the entire year show no batter, even though the rail ends are not hardened.

The amount of gap between the rail ends is of no particular importance, so far as batter is concerned, or, at least, this is true for gaps usually encountered, so long as there is some gap. In many rail joints the rails are tight through the warm months of the year and slightly open during the cold months. Such joints will batter less than joints which are opened throughout the entire year about in proportion to the traffic which passes over them during the time they are tight as compared with that passing over them when they are open.

Batter results in pounding and impact from passing wheels. This pounding wears the contact surfaces of the joint and the bolts, and the resulting looseness reacts to increase the pounding and the rapidity of destruction of the rail joints. Very rigid track, such as concrete track, seems only to accentuate the pounding and the results of impact, so that the remedy for batter does not seem to lie in making the track stiffer or more rigid. Again, because of the greater loads of locomotive wheels, the latter are thought to be important in the formation and development of batter, and this applies particularly to the heavily loaded wheels of small diameter. Although not spectacular, like the kinking of rail, this form of damage is really of the greatest importance and justifies very effort to reduce it.

Hardening of the rail ends is a very profitable method of reducing batter and the building up of battered rail ends, accompanied by joint bar renewal or other means of tightening, is an important factor in prolonging the main track life of the rail. And, if I may interpolate a thought, statistical studies of rail renewals today will give very misleading indications of deferred maintenance unless the results of rail end hardening and the building up of rail ends are adequately allowed for.

The welding of rail into long stretches is primarily an effort to overcome the results of batter and the same is true of the present day practice of lessening the amount of expansion gap where joints are not welded. However, any modification in locomotive design which will lessen the unit pressures of wheels on rails will help to reduce this form of damage about in proportion to the reduction.

Transverse Fissures

Transverse fissures are now known to result from internal stresses set up by the wheels in the head of the rail. They develop from minute microscopic cracks known as shatter cracks, which are found in a small percentage of the rails and which are now thought to be the result of too rapid cooling of the rail during the process of manufacture. These small cracks provide the sharp interior angles from which the fissures develop under reversals of stress. We all know that a sharp interior angle is to be avoided in a piece of metal subjected to stress reversals.

Fortunately, the Sperry detector car permits the detection of most transverse fissures while these are very small, so that rails having them may be removed before failure occurs under traffic. The detector cars can locate fissures while the latter are quite small and their growth under traffic may be proved by subsequent tests from time to time; also the fissures themselves contain evidence of the progressive nature of their growth.

The internal stresses causing the growth of shatter cracks into transverse fissures are most reasonably to be considered as tension stresses. These are set up at the same time that the head of the rail is subjected to compression, considering the whole rail as a beam. For the internal tension stress to be effective in causing the shatter crack to grow, it must exceed the bending or compression stress. The latter has the greatest unit value in the very topmost fibres of the rail head. But

transverse fissures always have their origin some distance below the top of the rail. These facts seem to point to the conclusion that it is only the unusually heavy load and probably it is only the unusually heavy load from a small wheel that is sufficient to create an internal tension stress great enough to counteract the compression stress resulting from the beam action of the rail. This, of course, is only a surmise, but the irregular growth of transverse fissures points to the fact that locomotive trailers are probably very much more important in this growth than ordinary car wheels. The occasional out-of-round car wheel or the car wheel with a bad flat spot must also be looked upon as a probable offender.

To complete this exposition, I should mention the internal stresses set up in the rail during the cooling as being important in a study of the mechanics of transverse fissures, I should also mention the recently improved rail mill practices which not only avoid shatter cracks but greatly reduce these fixed internal stresses in the rail. The transverse fissure problem seems to be well on the way toward solution through improved methods in rail manufacture but there are many thousands of miles of track containing potential transverse fissures which will be with us for many years and reductions in unit stresses at points of contact between wheels and rail will contribute to safety.

Rail Burns

Rail burns are caused by locomotive drivers slipping while steam is being worked. The surface of the rail is ground to a cup-shaped spot corresponding somewhat to the flat spots which occur on car wheels when the car wheels are slipped along the surface of the rail. Several such spots or burns usually occur along the rail length. Ruling grades, winter weather and heavy trains are the most frequent factors causing burns. They are quite common at points where heavy passenger trains must be started under adverse conditions.

Rail burns are usually not considered dangerous; that is, if the rail does not break immediately it usually does not break under traffic. However, the roughness is quite objectionable for passenger train operation and many rails are removed from track on that account. Unfortunately, rail burns show up as an indication with the Sperry detector car and we have had several cases where the detector car operator was misled by a burn indication close to an actual transverse fissure and failed to make the usual detailed investigation and report on the fissure, thinking the indication for the fissure was only a burn adjacent to the true burn. We have had such detected but unreported fissures break under traffic.

Surface Kinks

We now come to the last of my six classifications and the one which in some respects is of the greatest interest at the present time because of the relation of this form of damage to increased speeds. Surface kinks are not to be confused with the "sun kinks" formerly rather frequent when track and ballast were less substantial and when rail anchors were inadequate. Surface kinks in the rail are caused by overloading the rail as a beam. They vary considerably in degree, from those requiring immediate removal of the rail to those over long stretches of track which cause roughness of riding and make accurate surface impossible, although not sufficiently bad to necessitate immediate rail removal.

Formerly, before the present day high speeds, surface kinks were almost always the result of hauling a dead engine with the rods removed or of the operation of some one type of locomotive of particularly poor design at speeds beyond the possibility of effective counterbalancing. Such cases of damage were characterized by regularly spaced kinks, from the measurement of which the diameter of the offending driver could be determined. But more recently another type of kink has appeared where there is no regularity of spacing. In the words of some of the chief engineers reporting this newer form of kink damage, it may be described as follows:

"In addition to the counterbalance type of damage, we have had rail otherwise bent. In some cases this damage consisted of bending the rail, largely surface bending, but not as sharp and distinct bends as in the case of counterbalance kinking and not regularly spaced as to distance, as almost always occurs in counterbalance kinking. This type of rail damage has developed in the higher speeds. We have also had some damage develop in rail where there was an actual bending of the head on the web, with no fracture or rupture of the metal whatever; this we have rather definitely traced to high speed of heavy locomotives in passenger service. I think the counterbalance bending is no more serious or frequent than it used to be while the other type of bending is a more recent development and is undoubtedly due to high speed."

"For the past three or four years . . . we have been experiencing trouble with surface-bent rails. We have not been able to connect these surface bends with any defect in counterbalance or driver tires. Neither have we been able to attribute it definitely to track conditions, soft ties, etc. There was no uniformity in the location of these bends or in the distance they were apart. They were permanent sets in the rail and produced very bad riding conditions until removed."

"My personal observation is that kinking is a combination of conditions. Otherwise one would expect kinks to occur in regular rotation, such as a function of the driving wheel diameter. My observation is that kinking is quite irregular. . . . It is my further observation that such kinking has come about since the advent of increased train speeds, particularly that of freight trains."

These quotations from three different western railroads describe this kind of kinking. The following quotation describes a somewhat different result from what may be a similar cause:

"Another class of damage . . . is caused by operating locomotives with out-of-round drivers at high speeds. . . . A locomotive driver tire that is worn 1/16-in. out-of-round in a length of 24-in. to 40-in. will cause damage and where these tires are continued in service until they are worn to a depth of 3/16-in. or less they will cause very serious kinks, both inward and downward.

"Out-of-round drivers cause us a lot of trouble during winter months when temperatures fall to zero or below. They cause excessive breakage in rails; the breaks start in the base. . . . We have from 5,000 to 7,000 failures annually in our main line tracks. We removed 8,928 surface bends in 6,898 rails in a distance of about 200 miles in 1936. Some of the rails were on eastbound and others on westbound tracks. Some were north rails and others south rails. There were 42 track miles on which rails were straightened, which would have meant about 210 bends in 164 rails per mile."

Another engineer reports that "last year we had to straighten about 22,000 rails, practically all of which were engine bent, and to climax the year, one engine on one trip, in a distance of 55 miles damaged 3 track miles of 90-lb. rail, a little over 3 track miles of 110-lb. rail, and nearly 4 track miles of 112-lb. rail."

This last quotation bears out the idea that the problem of kinked rails cannot be solved by mere increase in rail stiffness through the use of heavier rails, even if such a remedy was financially possible.

That not all kinked rails are the result of excessive speed is indicated by an occurrence on my own railroad. A series of kinks was found on the low rail only of a 3-deg. curve located on a ruling grade where the loco-

motive was working steam hard and where the extra weight on the low rail, plus the vertical component of the thrust of the main rod, plus the effect of insufficient counterbalance and the leverage caused by the plane of the main rod (its thrust being different from that of the wheel and rail), was sufficient to over-stress the rail each time the main pin was in its downward position. Although such occurrences are not unknown, much the greater part of this form of damage is done by improperly balanced locomotives running at too high speed.

It is not my purpose to attempt to provide the answer to the problems of rail damage by locomotives. Some of this damage is independent of the weight and stiffness of the rail while other damage could be eliminated by sufficiently stiff rail if such rail was economically possible. But I will suggest a few of the suspected starting points for cooperative research and improved design.

One of these is, of course, the matter of counterbalancing. The Stresses in Track committee of the American Railway Engineering Associates has already pointed out some of the probable weak points in our present counterbalance practice. For example, there is a considerable error in calculation if the fact is disregarded that the main rod, side rods and the pins are not in the same plane as the wheels and rails and, therefore, have a moment arm which materially increases the effect of their inertia. Also, it is the practice, at least on some railroads, of balancing locomotive drivers after they have been mounted together as a pair on the axle; yet it is quite conceivable that either driver can be considerably out of balance while the two together, under the static test for balance, can show balance. It is not entirely possible that such a pair of drivers might operate fairly satisfactorily at moderate speed but would be anything but properly balanced or balanced to the best advantage under present day high speeds.

The replacement of the more or less rule-of-thumb methods of counterbalancing drivers with more scientific determinations can reduce the damage on this account, particularly, the question of efficient counterbalance should be one of the principal considerations in locomotive design. The opportunities afforded by modern high strength alloys for the reciprocating parts of the locomotive should result in very considerable benefits.

Then, somewhat apart from the question of rail damage, is the effect of the shape of the wheel tread and the gage of the track on the riding qualities of the locomotive. With the higher speeds, there is a tendency for the coned wheels to cross from side to side, that is, to first ride against one rail and then the other. Is it not quite probable that a slight reduction of gage and also a reduction of the coning of the wheels—perhaps making them cylindrical—would be beneficial?

And is it not possible through an increase in the area of contact between wheel and rail from a change in the shape of either or both, to reduce the overstressing of the rail steel and thus retard the flow of the steel and the damage known as batter? These and similar problems are among those for which we can hope for answers by co-operative action between track and mechanical men such, for example, as the joint committee headed by Dr. Talbot.

The Solution

By D. S. Ellis*

Many years ago (in 1895), D. L. Barnes, associate editor of the Railway Gazette, in a discussion of the subject of counterbalancing, laid down a simple rule that is just as applicable today as it was when it was first uttered, viz., "Keep the reciprocating parts so light that it makes little difference how much or how little we balance." While this rule has never wholly escaped the attention of designers, the fact is that, as locomotives have grown in weight and power, the difficulties in the attainment of any substantial reduction in unbalanced revolving weights have not only multiplied, but the dynamic effects produced have been intensified by the increase in wheel loads which has also occurred.

These conditions have provoked a renewal of interest in all factors influencing rail pressure and the effects of reciprocating balance are receiving revived attention. It is suggested that throughout the period of discussion of the subject, the matter of dynamic augment may have obscured other important factors that have a great influence upon roadway reactions and that may have as important a bearing upon the detrimental effects of dynamic forces as the most prominent sources of those effects. I refer to all of the various factors that create the final stresses, and those factors include certain characteristics peculiar to each individual locality.

In any consideration of the influence of dynamic augment, it must be recognized that the extent of the damage to track and structures is not necessarily determined by the magnitude of the unbalanced revolving weights. In the case of any rotating body whose mass is not concentric with the center of revolution, vibrations will be set up in the component parts of the structure and these vibrations will extend to the substructure. The periods of vibrations of these parts differ and the vibration of the unit as a whole will be the sum of the vibrations of the component parts, so that it is impossible to predict with any degree of certainty what the period of vibration will be in the revolving masses as a whole, or for the same reason, that of the supporting structure.

Coincident Periods of Vibration

In the case of railroad track, the period of vibration is influenced by the shape, length and weight of rail, by the number and character of the fastenings, by the shape, weight, spacing and condition of the ties and by the elasticity of the roadbed. Where the vibration period of the track coincides with that of the superimposed revolving masses of the locomotive, relatively small masses may produce disturbances out of all proportion to the total weight involved. This is mentioned here because recent tendencies in locomotive design, as well as developments that have been made in the reduction of reciprocating weights, have tended to divert attention from the fact that under existing operating conditions some of our older locomotives may have developed potential causes for serious effects upon equipment and track that did not exist at lower speeds.

Railroad operating requirements have in many instances made it necessary to utilize certain classes of locomotives at operating speeds 30 to 40 per cent higher than those generally prevailing at the time these types of locomotives were built, and it is quite probable that these speeds may carry the operation through the critical vibration range, that is, those speeds where the harmonic vibrations of the parts may synchronize and thus produce destructive results. Wherever unusual effects have been observed, this aspect of the matter should be investigated promptly in order that the most effective remedy may be applied. Obviously this can be determined only by proper analysis of each individual case.

It is further interesting to note that in addition to the ordinary effect of improper underbalanced weights upon the track and locomotives, high speeds may introduce

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another important factor due to the fact that the influence of underbalanced revolving weights increases directly with the square of the speed of rotation, or in other words, an increase in speed from 70 to 100 miles an hour, or 43 per cent, will actually double the dynamic augment; thus it is entirely possible for the upward reactions of the unbalanced revolving weights to exceed the static rail load, thereby producing a series of harmonic impact blows of serious magnitude on the rail, which may have destructive and costly results, and, incidentally, cause slipping of drivers at high speed with consequent loss of efficiency, rail damage, damage to machine parts and, in many cases, damage to axles, crank pins and rods.

Adapting Earlier Locomotives to Modern Needs

Many of our earlier locomotives built for relatively low speed and tonnage have been adapted to modern transportation requirements through such expedients as construction limitations may permit but there are important details whose dimensions are fixed in the original construction that cannot be altered except at a prohibitive expense. Many of these locomotives were inadequately balanced even for the relatively slow speed for which they were originally built, and now are obviously underbalanced. Because they were not intended to develop high horsepower at speeds around 60 miles an hour, they had low wheels with high tractive power.

Probably all of these locomotives would be underbalanced at substantially higher speed and usually these locomotives were designed with all the counterbalance permitted by driving wheel diameters. These locomotives have been a problem in counterbalancing which has required the introduction of all the best known means for obtaining a relative increase in the counterbalance weights, leaving for the future those refinements in materials and design which have not yet been fully developed. Enough has been said of this situation to show the necessity for a review of all locomotives operating in through line service having driving wheel diameters of 63-in. or less in order that a proper check of dynamic augment may be made. While this should be reduced to an absolute minimum, after the possibilities in this direction are exhausted, local conditions may require that a maximum limit be established through fixing a maximum speed for these locomotives which may still develop excessively high impact stresses.

Greater Attention to Design Details are Essential

These considerations show the necessity for greater attention to design than heretofore, and also to those elements of maintenance whose deficiencies may be reflected in an increase of dynamic effects of various origins. These effects may be summarized as follows:

(1) Underbalanced reciprocating weight.
(2) Unbalanced revolving weight.
(3) Couples produced by piston thrust on the crank pins and by lateral differences in the vertical planes of reciprocating weights and their counterbalances in the wheels.
(4) Variation in wheel loads due to static weight; spring deflection with consequent load transfer; center of gravity; and rail elevation.

The means for establishing the most favorable counterbalancing conditions are all so well known that it is probably unnecessary to discuss any of them here. It is apparent, however, that there are possibilities for refinements in the design of the reciprocating and revolving parts and also in the adaptation to those parts of certain alloy steels possessing higher physical properties than can be obtained with the carbon steels now in general use. It is anticipated that with increasing experience in the production of these steels and in their application to locomotive design and as experience is gained with them by railroad maintenance forces, their use may be greatly extended. The possibilities in the use of such steel are indicated in the table showing a comparison of two types of locomotives recently built.

Comparative Dynamic Augments in the Case of Two Recent 4-4-4 Type Steam Locomotives Equipped with Alloy Steel vs. Carbon Steel Rods, Pistons, Crossheads, etc.—All Figures Shown in Pounds

Type 4-4-4	Locomotive No. 1 Back	Locomotive No. 1 Main	Locomotive No. 2 Back	Locomotive No. 2 Main
Estimated weight of rods on pins—carbon steel	215	585	260	670
Weight of rods—high-tensile steel	168	460	204	522
Weight saving on pin	47	125	56	148
Dynamic augment with carbon steel rods	7,800	7,800	8,550	8,550
Dynamic augment with high-tensile steel rods	7,200	7,200	7,620	7,620
Reciprocating weight with carbon steel rods	870		1,090	
Reciprocating weight, high-tensile steel rods, lighter pistons, crossheads, etc.	798		1,003	

The foregoing illustrates the definite possibility through the use of the so-called alloy steels. I would call particular attention to the fact that considerable education will be required of supervision and mechanics with respect to the proper use and treatment of alloy steels before we obtain successful results. In other words, it is highly essential that alloy steels be given the proper care and use and under no condition be abused if we expect to obtain the benefits possible through their use.

Lateral Pressure on Rails Important Factor

As previously mentioned, there is another important feature of locomotive operation which has an important influence on track damage, and that is the lateral pressure on the rail produced by locomotives of relatively long rigid wheel base. These stresses are being greatly increased through increases in the driving wheel diameters incident to the requirements for higher locomotive speeds. This situation demands that most careful consideration be given to current locomotive designs in order that locomotives may be operated smoothly and safely through curves at the higher operating speeds now required. Particular attention should be given to the changing relationship of wheel tread and rail over the more important curves in order that there may be a minimum tendency for binding between the wheel flanges and the inside of the ball of the rail and the least transverse movements of wheel tread over rail, both of which not only produce large increases in train resistance but also increase the tendency to derailment. This requires careful consideration of the lateral motion characteristics of the engine truck and if necessary, provision should be made for modification of the rigid wheel base through the use of lateral resistance devices on the front and rear driving wheels. These latter are matters which require further consideration before it can be definitely determined that the conventional practice with respect to these subjects is wholly suited for requirements of speeds approaching 100 miles an hour.

These observations clearly indicate that recent developments in the design and operation of locomotives have raised anew and even more forcibly all of the problems relating to the dynamic effects of moving locomotives which have always been a subject of study and discussion on the part of railroad engineers generally.

Wheeler to Close Pettengill Hearings

WASHINGTON, D. C.

CHAIRMAN WHEELER of the Senate committee on interstate commerce appeared at the April 5 session of hearings on the Pettengill bill and announced that the long-drawn-out proceeding, which Senator Johnson of Colorado charged the day before amounted to a filibuster on the part of the opposition, would be brought to a close on April 13. In taking this action the chairman recalled the promise he had made at the opening of the hearing (February 24) that the Senate is going to have an opportunity at the present session to vote on the bill.

Senator Wheeler fixed the April 13 closing date after consulting with an opposition spokesman who said that 30 opposition witnesses remained to be heard. The chairman said the committee could not hear 30 more witnesses, and suggested that the hearings be closed at the end of this week. He did not insist on the latter, however, after counsel for the railroads and the railroad brotherhoods had each asked for an hour of rebuttal time; he agreed to permit the opposition to continue through next Tuesday's session and to devote the final hearing day to the rebuttals. In settling the matter on that basis the chairman observed that the measure had been given "more time than almost any other bill presented to the committee."

Senator Johnson's "filibuster" charge came during the testimony of J. G. Bruce of the Idaho Public Utilities Commission who appeared on April 4. The senator confronted the witness with what purported to be a copy of a letter written by the latter to the Chamber of Commerce of Medford, Ore., on March 28. From this document Senator Johnson read a sentence which said that "The opposition is trying at this time at considerable expense to prolong the hearing before the Senate committee as long as possible so that the bill will not come to a vote during this session of Congress." Mr. Bruce said that he did not think the foregoing language was included in a letter which he admitted having written to the Medford Chamber of Commerce. He agreed to supply a copy of the letter for the record.

After some further discussion with the witness Senator Johnson declared that "the committee has been far too liberal in permitting the hearing to extend beyond reasonable lengths;" and he left the room declaring that "the only way I can show my resentment is to stay away just as other senators do." The latter was a reference to the increasingly poor attendance of committee members as the sessions dragged along—many times none but a chairman has been present, and the chairmanship has rotated among many different members.

After making the closing arrangements Chairman Wheeler got in a few observations on the bill and the transportation situation in general during the testimony of J. J. Geary, who appeared on behalf of Pacific Coastwise steamship lines, and lines operating between the Pacific and the Gulf of Mexico. It seemed to the chairman that "the answer to this problem is not to pass this bill" but rather to bring all transport agencies under equitable Interstate Commerce Commission regulation. He went on to say that the fact that the Interstate Commerce Commission has decided fourth-section cases against the railroads is no more of an argument for long-and-short-haul clause repeal than would be a plea for repeal of the Interstate Commerce Act based on the fact that the carriers did not get the entire 15 per cent increase in rates which they sought in Ex Parte 123. Senator Wheeler conceded that "perhaps" the Interstate Commerce Act should be repealed, but he thought that was neither here nor there—he believes that if the government is going to regulate railroad rates, it should regulate those of all transport agencies on the same basis. It was also the chairman's view that competing transport agencies should endeavor to resolve their competitive struggles in mutual negotiations with some agency like the I. C. C. acting as referee.

At another point Senator Wheeler, referring to the Southern Pacific's interest in the bill, calculated that road's fixed charges at $44,000,000 a year. "I just don't believe," he added "that the Southern Pacific or any road of that size can stand up with $44,000,000 of fixed charges—that's one road that I think is in need of reorganization."

In addition to Mr. Geary, opposition witnesses appearing on April 5 were W. L. Shadduck of the Idaho Falls (Idaho) Potato Growers Association; R. H. Young, a Parma, Idaho, farmer who appeared "as one who would be injured" by passage of the bill; and Charles Gossett of Nampa, Idaho. The previous day's witnesses, in addition to Mr. Bruce, were: A. E. Charles of the San Francisco, Calif., Junior Chamber of Commerce; N. Harlan of the Idaho Potato Association; Guy Graham, secretary of agriculture of Idaho.

Appearing on April 5 was Harry C. Ames, counsel for the Mississippi Barge Lines, who also inserted into the record a statement by that company's president—J. W. Childress. Also, J. G. Burns, representing the American Steamship Owners' Association.

Last week's witnesses, appearing after those listed in the *Railway Age* of April 2, included: C. H. Callaghan, Maritime Association of the Port of New York; R. G. Narelle, Canal Carriers' Association of New York and New York State Waterways Association; W. J. Petersen, Pacific American Steamship Association, Shipowners' Association of the Pacific Coast and Waterfront Employers' Association of San Francisco; F. E. Ledwidge, Granite City Steel Company; James Mullen, National Maritime Union; R. K. Keas, Laclede Steel Company; Amos A. Betts and W. T. Wright, Arizona Corporation Commission.

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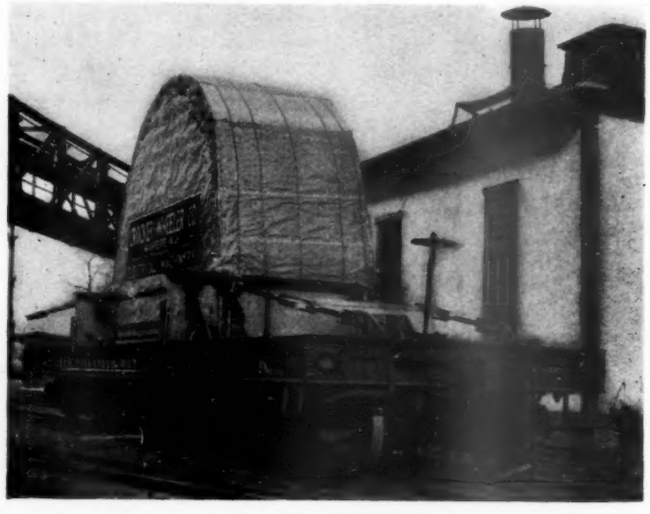
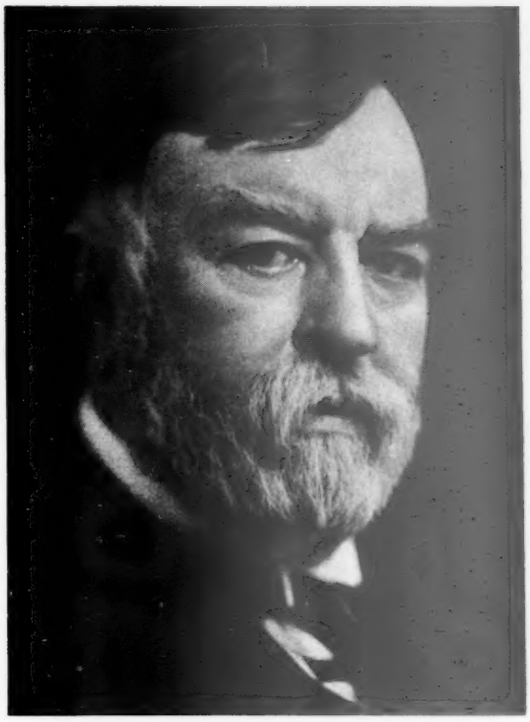


The Lackawanna, Pennsylvania and Chesapeake & Ohio Transported This Large Stator, Part of a Water Wheel Generator, on Sunday, March 13, From Ampere, N. J., to Langley Field, Va. The Stator Weighs 73 Tons and Stood 15 Ft. 9¾ In. Above the Rails, Requiring De-Energization of the Catenary Wires in Lackawanna Territory

L. F. Loree Resigns D. & H. Presidency

Colorful D. & H. chief and former K. C. S. chairman ends active career at 80



Leonor F. Loree

LEONOR FRESNEL LOREE, president of the Delaware & Hudson since 1907, tendered his resignation to the board of managers of the company, effective March 31. Mr. Loree, who is nearing 80, found it necessary several years ago to check severely the hitherto vigorous pace of his business activities and during the past year has been found only infrequently at his desk in the New York office of the company. As announced in the resignation statement, Mr. Loree will probably be unable to attend board meetings in the immediate future, and prefers, therefore, to step down from his post of active leadership. No successor has as yet been named.

Mr. Loree is known widely as one of the country's most colorful and able railroad executives. At an early age he drew the attention of important operating officers by the high quality of his roadway restoration work and from this first flush of success went on to become one of the most versatile of operating officers, whose accomplishments include the invention of the upper quadrant semaphore signal, organization of the first railroad police unit, development of the lap passing siding; pronouncement of pioneer theories, both broad and practical, of labor-management relations; fatherhood of the so-called fifth eastern trunk-line system; authorship of a famous "bible" of railroading, "Railroad Freight Transportation"; and presidency of three important railroads, the chairmanship of another, and directorships in 27 other carriers and corporations. And in all these varied exploits, Mr. Loree displayed those original qualities typical of a vigorous body and mind which constitute "news value" to the press, and made him a well-known figure to the lay public. For many observers of the transportation scene, Mr. Loree represents the last of a genus of railroad leaders and with his passing from active endeavor an epoch in American railroading is ended.

It was as an engineer that L. F. Loree first entered the officers' ranks. Almost from the first he carried his part with an independence and drive that brought him into prominence "at headquarters." While yet but a junior officer on the Pennsylvania, he prepared a criticism of plans that had been sent out from the chief engineer's office for the construction of a yard. This stroke of boldness gained, not suppression from above, but close attention to his contentions and the yard was built according to his ideas.

In 1878, when but 20, he was concerned in the rebuilding of the Raritan River bridge of the P. R. R. and had the trains running in six days. After the 1886 floods in the Miami River valleys he restored 26 iron bridges, two trestles, three stone arch culverts and seven miles of track in five days. Much of this phenomenal success was due to his skill in the marshalling of large forces under emergency conditions; it is said that his method was military in character, especially in the handling of the commissary.

Again, while he was engineer of maintenance of way of the Chicago division of the P. R. R., his excellent work in developing new methods led to his transfer to the Cleveland & Pittsburgh division, the

Named by his Own Hand

"Master of Transportation! Once a significant but now an obsolete title; how many are there in the service to-day competent to bear it? Yet until we have Masters of Transportation and goodly number of them; until their voices are not only heard but heeded; until, in short, transportation again comes into its own, we shall fall far short of making our railroads what they have been and may be again—chief among the servants of our industrial civilization."

—From Mr. Loree's "Railroad Freight Transportation"

"hot spot" of the system, overloaded by an ever-increasing Pittsburgh-Great Lakes ore and coal traffic, and bristling with bad grades and curves. At the age of 30, Mr. Loree assumed responsibility for the roadway of this "problem child," a year later was made superintendent, and accomplished so much in the way of grade reductions and improvements in alinement, strength of bridges and power of locomotives, that "Philadelphia" made him general manager of the entire system at 38.

As an operating man, Mr. Loree displayed an amazing versatility. Although educated as a civil engineer, he broadened his interests very early in his career and during his life demonstrated his expertness in every department of railroading. He fought hard for bigger motive power, often alone. He believed that a railroad should be as flat as possible, and embodied this belief in his dream of a fifth eastern trunk line. Later, as president of the Delaware & Hudson, Mr. Loree established his road as a pioneer in research work which was responsible for experiments with high-pressure locomotives, continuous welded rail and other developments. In all these interests, he showed a thoroughness that balanced well his more colorful role as financier and railroad "magnate." Thus the Railroad Gazette, in April, 1907, commented editorially: "His character seems to have been logically developed in the early plodding days as a subordinate engineer, in a staff where accuracy and thoroughness was the ideal, and in his later experience with great emergencies."

Mr. Loree has held three railroad presidencies. From 1901 to 1904 he headed the Baltimore & Ohio. He took the road over when much-needed rehabilitation work had just begun, and built anew a complete system of interchange freight yards, reduced many grades, introduced the first Mallet articulated type of locomotive ever built and operated in the United States, and built a fleet of what were then "huge" freight cars. During this time his attention was first called to the working conditions of the "white-collar" employees in the accounting offices; he ended over-time work through such devices as duplicating and bookkeeping machines, and raised the wages of clerks to decent levels.

In 1904, Mr. Loree became president of the Chicago, Rock Island & Pacific, and was faced with the task of consolidating the varied geographical interests of the new combination of the Rock Island and the St. Louis & San Francisco, which covered a wide territory. Troubles in the financial circles dominating the road irked him, however, and he left after but nine months' service. In 1907 he accepted the presidency of the small but prosperous Delaware & Hudson from a close friend and adviser, E. H. Harriman, succeeding David Willcox. At the same time, he became president of the corporation's board of managers, thus becoming responsible for financial as well as operating matters. Under Mr. Loree's chieftainship, the D. & H. became a thoroughly modern railroad and was put in excellent financial shape. The new president was especially successful in funding a large floating debt incurred by heavy purchases in Canadian railroad links, coal reserves and interurban electric lines. The dividend rate to stockholders was maintained at nine per cent every year until the recent depression cut into all railroad earnings.

As D. & H. president, however, Mr. Loree departed from his former preoccupation with purely operating matters to enter the exciting game of railroad buying, selling and agglomeration. As president of the B. & O., he had acquired for the road a dominant interest in the Philadelphia & Reading and the Central of New Jersey, and, upon election to the chairmanship of the executive committee of the Kansas City Southern in 1906 had initiated financial plans in the Southwest, but it was as president of a small road with plenty of surplus cash for filling its securities portfolio with judicious "buys" that Mr. Loree came into the real prominence as a financier.

He opened fire with his so-called "fifth trunk line" in 1925, when he submitted informally a plan to the Interstate Commerce Commission, while it was still considering the general "four-system" plan of railroad consolidation. This new trunk line was to consist mainly of the existing Buffalo, Rochester & Pittsburgh, the Delaware & Hudson, the Lehigh Valley, the Wheeling & Lake Erie and the Wabash roads, together with a proposed low grade line through central Pennsylvania to be known as the New York, Pittsburgh & Chicago; it was to be 50 miles shorter than any existing road between New York and Chicago and 30 miles shorter than any route between New York and St. Louis. The fifth trunk line was never formed; nor did the I. C. C. plans come to fruition. Mr. Loree lost the B. R. & P. through refusal of its directors to extend an option held by the D. & H. to lease the road, while the New York Central, the Baltimore & Ohio and the Nickel Plate gained control of the Wheeling & Lake Erie, a key road in the trunk line plan.

These set-backs did not discourage Mr. Loree. He still believed in individual voluntary railroad consolidations and deprecated pre-formed consolidation plans as dictated by the Transportation Act of 1920. After heavy buying and selling by the Delaware & Hudson in the stocks of the Wabash and Lehigh Valley, with considerable profit accrued, Mr. Loree, in 1929, sprung a new plan on transportation circles—the North Atlantic Terminal System. This plan provided that the D. & H. acquire roads having a total length of 13,553 miles and would incorporate into the D. & H. family, 17 Class I carriers, including the New Haven, the Lackawanna, the Western Maryland and the Boston & Maine. The depression ended this dream. His last incursion into railroad stock purchases was in connection with the purchase of 495,000 shares of New York Central stock in 1932. D. & H. now holds 410,000 shares.

Mr. Loree also laid plans for a southwest railroad empire. In 1926, as chairman of the Kansas City Southern, he filed a plan providing for acquisition of stock control of the Missouri-Kansas-Texas by K. C. S. and control of the St. Louis-Southwestern, in turn, by the M-K-T, to form the Loree Southwestern Lines, comprising 5,801 route-miles. The I. C. C. "killed" the plan by a 7 to 4 vote on May 4, 1927. In 1929, the commission revoked an earlier order permitting Mr. Loree to serve as a director of the M-K-T while serving as chairman of the K. C. S. Mr. Loree resigned from the latter post in 1937.

Mr. Loree gained repute as a leader of men. He concerned himself all during his career with labor problems. Essentially, he believed in discipline and fairness. At a luncheon held at the dedication of a new B. & O. import pier at Baltimore in 1903, he declared, anent staff matters: "It must always be kept clearly in mind that discipline contemplates two distinguishable attitudes: The person disciplined may be a disciple, a learner, a scholar, or he may be one subjected to punishment. Both relations contemplate knowledge, capacity, fair dealing and resolute courage on the part of the officer chargeable with administering discipline. There must be such continuity of service as will insure to each a reasonable hope of advancement, and to the entire body a continuous policy; a history personal in its character, and an *esprit de corps* founded on mutual respect and confidence."

He was a distinguished speaker and writer and had a background of legal knowledge in addition to his formal training in engineering. All his life he remained an

omnivorous reader and possessed a considerable literary background. He wrote on all matters in railroading and could pass with ease from a discussion of culvert construction to a theory of government regulation. The latter, incidentally, irked him, and he once referred to it as a "rake's progress," bound to become successively worse. These talents are bound up together in his great commentary, "Railroad Freight Transportation," the title of which is a misnomer; in reality, the book covers every problem of railroading from the proper spacing of ties to the "I. Q." as a measure of employee ability, interlarded with literary references and heated discussions of socialism. It is compounded on grand scale, an "anatomy of railroading," after Burton's own epic vision of the human mind. As such it is a fitting monument to its versatile author.

L. F. Loree was born in Fulton City, Ill., on April 23, 1858, and was educated at Rutgers University, receiving his B. S. in 1877, his M. S. in 1880, and his C. E. in 1896. He entered railroad service in 1877, as assistant in the engineer corps of the Pennsylvania and served in this capacity until 1879. He then served for two years as a transitman with the engineer corps, U. S. Army, and in 1881 went with the Mexican National Railway as a leveler, transitman, topographer on preliminary survey and location work between the Rio Grande river and Saltillo. In 1883 he was appointed assistant engineer, Chicago division, Pennsylvania lines west; in 1884 he became engineer maintenance of way on various divisions of the same lines, becoming, in 1889, division superintendent of the Cleveland & Pittsburgh division. In 1896, at the age of 38 he was appointed general manager of the Pennsylvania, and in 1901 became fourth vice-president.

In June of that year he was called to the presidency of the Baltimore & Ohio. He left this post four years later to become president of the Rock Island company and chairman of the executive committee of the Chicago, Rock Island & Pacific and the St. Louis-San Francisco, serving in this capacity for nine months. In 1906 he became chairman of the executive committee of the Kansas City Southern, which post he held until 1937.

The Delaware & Hudson made him its president and president of the Board of Managers in 1907. Between 1926 and 1928 he was chairman of the board of the Missouri-Kansas-Texas. At various times he was a director of the Erie, the National Railways of Mexico, the New York, Ontario & Western, and the Wheeling & Lake Erie.

Mr. Loree was president of the American Railway Association between 1899 and 1901 and in 1913 served as chairman, eastern group, Presidents' Conference Committee on Valuation. He was a member or chairman on several boards co-operating with the government on transport matters during the World War and served on the War Labor Board.

No Train-Limit Law at Present Session

WASHINGTON, D. C.

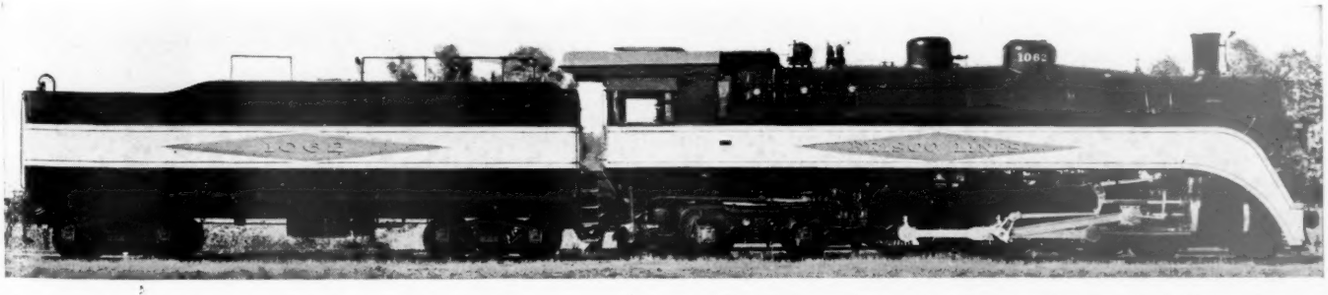
THE House Committee on Interstate and Foreign Commerce's March 31 vote of 14 to 7 against reporting the 70-car train-limit bill (S. 69) precludes, for the present session of Congress at least, the enactment of that measure, which the Association of American Railroads claimed would cost the carriers an additional $100,000,000 a year in out-of-pocket operating expenses along with additional outlays totaling $500,000,000 for rearrangement of facilities. Also, any future train-limit proposals will have to start a new journey through Congress, since the present bill, which passed the Senate on July 26, 1937, at the first session of the present seventy-fifth Congress, will die with that Congress at adjournment of the current session.

S. 69, which was reported by the Senate committee on interstate commerce without hearings, was sponsored by Senator McCarran of Nevada, who sold it to the upper body as a "safety" measure, denying that it had "make-work" aspects which would have any important effect on employment or railroad costs. The bill was cast in this same "safety-measure" role by representatives of railroad labor who appeared at hearings before the House committee on interstate and foreign commerce. These House hearings were in session more or less continuously from January 11 until March 18, producing a volume of testimony which prompted Chairman Lea to observe that "if there is anything else to be said on either side" he coud not imagine what it might be. The railroad presentation was directed by J. Carter Fort, general solicitor of the A. A. R., while national legislative representatives of the train-service brotherhoods made labor's case.

Before the House committee's adverse vote of March 31 the threat of train-limit legislation was more imminent than ever before; S. 69's passage by the Senate had advanced it further toward enactment than any previous train-limit proposal.

Passage of the bill by the Senate was without a record vote, although there had been a roll call which defeated, 51 to 17, a recommittal motion made by Senator Hale of Maine. In addition to Senator McCarran, its principal sponsor, a Senate speech in favor of the measure was made by Senator Wheeler of Montana. Among those speaking in opposition were Senators White of Maine, Dieterich of Illinois and Bailey of North Carolina. The latter warned railroad employees, whose legislative proposals, he said, he has usually voted for, that they "may keep on making demands on the railroads until they kill the goose that lays the golden egg . . . we cannot continue to put burdens upon the railroads without destroying their capacity to employ men."

* * * *



One of a Group of 2,500-Hp. Pacific Type Locomotives Converted to 3,600-Hp. Hudson Type at the St. Louis-San Francisco Shops, Springfield, Mo. Equipped with Larger Firebox, Feedwater Heater, Nicholson Thermic Syphon, Larger Superheater and Franklin Booster

Inventories Analyzed For Facts On Railway Supplies

Surpluses mostly in repair stocks—Increases under 10 per cent on 35 roads—$68,000,000 from scrap in '37

SUPPLEMENTING the publication of the annual inventories of the railroads in its issue of March 12, the *Railway Age* has completed a detailed analysis of special reports from practically every Class I railroad and several switching and terminal companies, showing the more important divisions of their inventories and also the consumption (not purchases) of the corresponding materials in the previous 12 months. The reports have been segregated by regions and the figures converted to show the percentage change from the previous year and the relation of inventories to consumption, and for the second consecutive year, the analysis has been enlarged to segregate old rail from new rail.

Materials on Hand, December 31, 1937, Class I Railroads

	Fuel (000)	Days' Stock	Cross-ties (000)	Months' Stock	Rail, New & S. H. (000)	Months' Stock
1929	$40,000	32	$95,000	8.1	$45,000	3.9
1930	28,200	40	101,200	10.9	44,700	4.9
1931	23,600	31	86,150	11.7	49,250	8.5
1932	20,500	36	67,200	14.8	48,100	18.0
1933	17,950	37	50,950	13.0	33,600	14.0
1934	19,930	34	47,297	11.0	36,885	13.0
1935	22,218	37	42,020	9.9	34,275	11.7
1936	26,137	36	40,542	8.9	31,226	6.5
1937	30,812	39	54,622	11.5	31,123	5.6

	Miscellaneous (000)	Months' Stock	Scrap (000)	Months' Stock	Total (000)	Months' Stock
1929	$292,000	3.5	$		$472,000	3.8
1930	246,500	3.8	10,300		430,900	3.8
1931	203,869	4.4	13,200		374,331	4.5
1932	170,000	5.5	12,800		316,800	5.9
1933	178,091	5.7	10,700		291,291	5.8
1934	181,455	5.0	11,898		297,465	4.6
1935	171,920	4.7	9,427	3.1	279,926	4.3
1936	199,743	4.4	9,926	2.1	307,574	4.0
1937	256,998	4.8	12,356	2.1	385,912	4.2

Days' or months' stock based on average consumption per day or month during previous year.

Aside from the fact that the inventories are in no way comparable in size to those immediately following the period of government operation, the figures show that material has ceased to pile up and is now undergoing gradual absorption. The figures show also that the excess of materials is mostly in stores stock.

Record Scrap Sales

The Class I railroads, according to the analysis, are estimated within close limits to have used $1,051,017,000 of materials and supplies in 1937, as compared with approximately $915,394,000 in 1936, and they obtained approximately $68,552,000 from the sale of iron and steel scrap, as compared with approximately $57,307,000 in 1936 and $36,500,000 from the same source in 1935. The consumption figures include on most roads second-hand and shop-manufactured materials as well as newly-purchased materials. Total disbursements of material in 1937 included approximately $286,071,000 of coal and fuel oil, $66,218,000 of rail, $57,111,000 of crossties and $641,617,000 of storehouse and miscellaneous supplies. The consumption of new rail totaled approximately $42,813,000 and the charges made for old rail relaid approximated $23,405,000. Based on the quantities reported, the railroads inserted approximately 57,000,000 crossties last year and sold approximately 5,700,000 tons of railroad scrap.

Stock balances of the Class I railroads at the close of 1937, totaling approximately $385,912,000, included approximately $30,812,000 of coal and fuel oil, as compared with $26,137,000 in 1936; $31,123,000 of rails, as compared with $31,226,000 in 1936; $54,622,000 of crossties, as compared with $40,542,000 in 1936; $256,998,000 of storehouse and miscellaneous supplies, as compared with $199,743,000 in 1936; and approximately $12,357,000 of iron and steel scrap, as compared with $9,996,000 in 1936. The rail inventory included approximately $13,111,000, or 320,000 tons, of new rails and $18,012,000, or 475,000 tons, of old rails, including rail on rests for track protection.

4.8 Months' Supply

Based on the average monthly consumption during 1937, fuel stocks on December 31 represented a 39-days' supply, as compared with 36 days in 1936, 37 days in 1935 and 30 days in 1930. Ties on hand December 31 were equivalent to 11.5 months, as compared with 8.9 months in 1936, 9.9 months in 1935 and 14.8 months in 1932. The stock of new and old rail represented a 5.6-months' supply, as compared with 6.5 months in 1936, 11.7 months in 1935 and 18.0 months in 1932; while the stores stock was equivalent to a 4.8-months' supply, as compared with 4.4 months in 1936, 4.7 months in 1935 and a 5.7-months' stock in 1933. The stock of all materials and supplies, including scrap, on December 31, 1937, represented a 4.2-months' supply, as

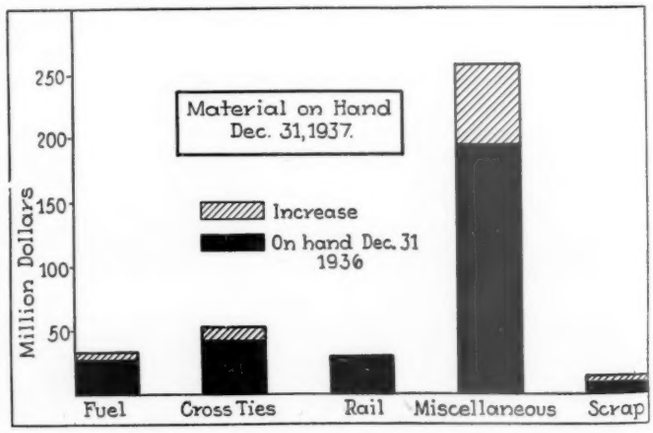


Chart Showing the Comparisons Between the Total Inventories of Selected Classes of Materials on December 31, 1937

compared with 4.0 months in 1936, 4.3 months in 1935 and a 5.9-months' supply in 1932.

Annual inventories, while approximately $78,338,000 larger on December 31, 1937, than on December 31, 1936, showed no aggregate increase in dollar value in stocks of fuel or rails over the previous year, despite the increased prices that were paid for materials purchased in 1937. The increases were mostly in storehouse and miscellaneous materials, which were larger in aggregate dollar volume than in any corresponding year since 1929 when the total was approximately $290,000,000. In that year the inventories represented a 32-days' supply of fuel, an 8.1-months' supply of ties, 3.9 months of rail and 3.5 months of store stock.

The annual inventories and annual consumption of materials on different roads are presented in detail in a table. The inventory and consumption figures are those reported by the railroads, except where otherwise noted. The per cent change in inventory and consumption was determined by comparing the figures reported for 1937 with those reported the year previous. The turnover figures were calculated by dividing the consumption for the year by 12 to obtain a theoretical average monthly consumption, and dividing the result into the stock balance.

In computing these figures, it was recognized that comparisons between inventories of different railroads are objectionable from some standpoints. Accounting practices are not wholly uniform because of differences in the manner of interpreting accounting rules of the I. C. C. Both inventory and consumption figures are also influenced by differences in the practice of valuing secondhand and reclaimed materials, and there are also differences in the practice of charging material out of stock and in disposing of unserviceable materials which are included in stock balances.

While these irregularities impair, they do not destroy the value of the comparisons. In the present analysis such comparisons are facilitated by separating those classes of material which are governed by different policies and conditions or which are controlled by different departments. Uniformity has also been promoted by requesting that inventory figures include all undisposed materials, including ties at treating plants, and that all materials reported as "used" be restricted to the value of materials issued to closed accounts. In practically all cases, the total inventories reported by each railroad correspond to the inventories reported to the Interstate Commerce Commission in its general balance sheet account No. 716.

Decks Clear On Some Roads

Fuel reported on hand at the close of 1937 showed increases over the previous annual inventories on 75 railroads and reductions on 35, according to the analysis, and the consumption of fuel during 1937 was larger on 90 roads and smaller on 12 roads. Stocks of new rail

Approximate Quantities of Material in Stock, December 31, 1937

	Fuel		Rail			
	Coal (tons)	Oil (gal.)	New (tons)	Old (tons)	Crossties (number)	Scrap (tons)
New England Region:						
Bang. & Aroos. ..	35,750		843	1,597	168,625	
Boston & Albany.	31,177	21,423	763	2,746	101,092	2,268
Boston & Maine.	57,607		537	8,409	634,639	
Central Vermont.	18,639		297	1,066	70,947	1,220
Maine Central ...	10,720		1,967	4,547	107,876	1,725
N. Y. N. H. & H.	151,876	440,739	2,331	21,140	603,378	19,318
Rutland	15,666	3,400	142	1,913	50,138	436
Great Lakes Region:						
Cambria & Ind...	481		5	164	4,096	375
D. L. & W.....	34,450	48,648	599	4,936	216,082	5,611
Detr. & Mack....	1,561			443	46,021	131
D. & T. S. L....	1,948	525	9	254	13,736	465
Erie	115,758	83,992	1,340	6,204	526,790	19,824
G. T. W.	82,541		928	9,769	101,214	7,613
L. & N. E.....	21,562	5,219	703	1,538	40,218	
Lehigh Valley ...	64,016	64,132	3,473	3,184	208,325	3,931
Monongahela	2,090	4,137	86	357	4,931	230
Montour	822	500	2	66	401	591
N. Y. C. & St. L.	63,600	36,678	517	8,180	160,991	3,993
N. Y. O. & W...	16,891		1,288		43,866	1,137
P. M.	59,145	32,651	256	3,912	351,305	
P. & S.	1,617		2	319	26,096	329
P. & W. Va.	4,590	6,590	886	1,093	9,883	3,678
P. S. & N.....	879		5	630	3,545	579
Central Eastern Region:						
A. C. & Y.....	1,930	398	113	263	6,021	439
Alton & Sou.....	9,233		366	147	1,639	161
B. & L. E.....	33,373	2,663	91	1,274	5,338	3,333
B. & O.	245,226	117,425	28,965	10,739	1,125,494	24,163
B. & O. C. T....	7,626	9,833	166	1,095	779	1,079
Cent. of N. J....	53,154	12,000	2,771	2,098	150,915	4,785
C. & E. I.....	25,808	9,500	472	9,107	220,260	4,096
C. & I. M.....	1,240	23,077	99	113	5,849	1,458
D. T. & I.....	7,879	9,406	133	2,841	124,038	473
E. J. & E.....	10,633	53,988	353	609	29,277	5,547
Reading	98,360	30,306				
Western Md. ...	45,830	37,789	153	1,296	447,552	4,908
W. & L. E.....	29,202	8,572	1,218	744	196,147	355
Pocahontas Region:						
C. & O.	183,178	1,000	541	13,754	846,080	4,874
R. F. & P.	18,483		280	750	154,742	
Virginian	12,166		136	3,783	296,778	
Southern Region:						
Ala. Tenn. & Nor.	260			153	5,789	
A. & W. P. lines	12,058		66	862	23,160	299
A. B. & C.....	18,450			489	102,578	677
Cent. of Ga.....	23,424		847	4,235	393,070	
Clinchfield	5,889		233	318	114,778	1,863
C. & G.	697	12,440	12	568	2,380	583
F. E. C.		7,674,030	567	13,833	115,118	5,683
Southern Region (Continued):						
Georgia	16,660		11	1,242	75,650	440
Ga. & Fla.	3,626	8,106		552	19,143	292
G. M. & N.....	12,485	17,897	68	2,668	126,656	2,050
I. C.	292,195	277,940	643	15,098	911,423	
L. & N.	322,080		24	13,154	1,490,283	
Miss. Cent.	4,135			830	68,335	
M. & O.	27,824	15,353	267	1,484	76,776	14,173
N. C. & St. L...	89,919		595	2,382	260,809	
Norfolk Sou.	10,981			1,246	123,030	4,423
S. A. L.	164,324	9,935	7,940	16,025	589,289	32,605
Southern	294,222	155,769	1,156	11,817	905,840	46,548
Tenn. Cent.	6,019	7,401	1,500	946	8,204	392
Northwestern Region:						
B. A. & P.	65		113	75	12,342	331
C. & N. W.....	280,890	4,120,364				
C. G. W.	637,132	59,989	1,028	2,223	82,563	17,018
C. St. P. M. & O.	29,939	84,776	3,131	6,730	443,731	3,420
D. M. & I. R...	145,036	24,957	276	2,891	192,522	2,818
D. S. S. & A....	5,069		33	1,904	22,526	
D. W. & P.....	248		2,827	853	38,261	263
G. N.	318,947	254,776				
G. B. & W.	2,336		83	396	53,473	573
L. S. & I.	18,688	905	5	2,316	12,344	843
Soo	49,023		446	6,064	342,048	
N. P.	121,320	2,404,438	2,759	15,433	1,661,373	
Spok. Int.	957		5	528	18,000	369
S. P. & S.....		3,167,977	52	2,047	191,355	1,994
Central Western Region:						
Alton	45,280	22,539	1,117	5,757	151,465	
A. T. & S. F.....	906,613		137,122	Not sep.	4,487,760	
Colo. & Sou.	29,853	269,949	115	4,151	74,804	1,292
D. & R. G. W...	29,032		11,630	12,229	629,147	2,882
Ft. W. & D. C...	2,470	4,365,362	137	1,019	9,081	2,280
P. & P. U.....	3,413	18,736	16	734	2,262	519
Utah	2,180		637	730	29,136	92
W. Pac.	11,996	4,267,280	2,736	12,972	348,205	2,185
Southwestern Region:						
Burl.-R. I.		83,772	38	66	35,650	36
Ft. S. & W.....	178					
G. C. L.		12,941,754	583	5,218	74,590	1,690
I.-G N.	429	26,601,708	1,210	4,780	226,663	
K. C. S.	9,246	12,986,580	1,670	5,671		
K. C. Term'l ...	2,900	192,347	242	18	21,224	658
L. & A.	54	7,639,259	45	3,138	163,182	3,911
La. Ark. & Texas		1,256,204		893	55,819	245
Mo. & Ark.	840			32	6,840	500
St. L. S. W.....	2,930	27,981,870	1,597	8,749	399,392	
Term'l of St. L..	12,594	3,662	1,547	131	15,959	2,692
T. & N. O.	1,826	245,557	1,929	15,622	908,360	
W. F. & S.....		91,891			3,666	
W. Val.		72,362		55	1,142	61

Not reported where spaces are left blank.

Materials and Supplies Used and Carried

Road	Fuel — On Hand Dec. 31	Fuel — On Hand Inc. %	Fuel — On Hand Days' stock	Fuel — Used 1937	Fuel — Used Inc. %	Rail—New and Old — On Hand Dec. 31 New	Rail—New and Old — On Hand Inc. %	Rail—New and Old — Used 1937 New	Rail—New and Old — Used Inc. %	Rail—New and Old — On Hand Dec. 31 Old	Rail—New and Old — On Hand Inc. %	Rail—New and Old — Used 1937 Old	Crossties — On Hand Dec. 31	Crossties — On Hand Inc. %	Crossties — On Hand Months' stock	Crossties — Used 1937
Bangor & Aroostook	$176,519	..	133	$480,518	..	$34,544	..	$125,496	..	$30,857	..	$11,651	$92,338	..	12.4	$91,129
Boston & Albany	147,454	45	23	2,298,750	2	31,640	—3	68,379	138	55,272	—29	27,969	125,212	48	23.9	62,758
Boston & Maine	259,905	24	25	3,761,434	—5	21,502	—6	255,908	85	210,213	—45	232,012	971,565	—22	21.3	549,434
Central Vermont	92,958	210	45	753,908	4	13,180	7	9,253	146	30,342	—21	14,515	91,742	5	12.1	91,031
Maine Central	52,641	—23	22	889,074	—9	80,417	230	96,863	88	90,948	—6	41,610	138,690	—24	4.3	880,132
New York, New Haven & Hartf.	624,281	60	48	4,798,157	1	95,684	—78	765,107	79	528,250	17	329,409	649,719	73	17.6	442,025
Rutland	62,869	..	56	406,023	..	5,809	..	29,611	..	30,628	..	4,490	65,354	..	16.0	49,057
NEW ENGLAND REGION	1,416,627	..	39	13,387,864	..	282,776	..	1,350,617	..	976,510	..	661,656	2,134,620	..	15.4	1,665,566
Ann Arbor	71,299	132	53	486,360	—2	171	0	.....	..	15,733	29	19,152	48,951	67	9.7	60,360
Cambria & Indiana	986	68	10	34,603	0	140	0	10,416	—46	2,969	—39	1,630	8,270	62	3.5	27,919
Delaware & Hudson	659,166	22	113	2,130,024	5	56,391	—9	281,988	231	73,622	40	121,368	433,878	122	10.2	510,024
Del., Lack. & Western	123,829	—14	9	4,625,505	0	22,180	108	449,527	14	111,095	28	263,252	269,688	180	13.0	249,852
Detroit & Mackinac	6,444	—51	35	67,897	3	.....	..	.....	..	12,415	0	5,736	27,712	—24	15.0	22,221
Detroit & Toledo Shore Line	6,918	45	30	160,731	—3	347	17	21	..	5,832	—57	3,024	21,736	—14	9.0	29,032
Erie	256,097	19	16	5,811,623	20	52,552	125	878,974	15	172,029	—13	450,136	597,536	10	9.8	730,624
Grand Trunk Western	273,766	150	46	2,169,051	4	35,642	380	161,829	—7	244,230	—11	163,149	162,640	2	4.4	440,432
Lehigh & Hudson River	10,057	102	28	128,614	—6	23,899	46	17,672	172	2,294	1	3,149	12,810	61	5.7	26,954
Lehigh & New England	72,846	34	95	282,435	—7	28,867	42	45,964	55	43,064	—3	16,128	41,762	32	19.2	26,188
Lehigh Valley	170,503	—53	14	4,473,445	—5	130,745	..	37,971	—7	63,564	—10	135,223	309,257	10	42.9	86,745
Monongahela	4,051	..	11	129,715	15	3,274	—25	37,845	75	9,242	60	31,189	9,130	..	1.3	82,839
Montour	1,793	110	5	116,971	13	68	..	11,332	—37	744	5	1,127	710	—58	.4	18,057
N. Y. C. Sys. excl. B. & A.	1,306,713	—5	24	19,717,620	6	1,468,545	22	5,137,812	39	Not sep.	..	Not sep.	4,419,868	35	15.6	3,399,936
N. Y. C. & St. L.	201,714	18	23	3,157,557	5	20,179	55	518,239	7	227,991	3	393,478	204,674	483	5.6	432,923
New York, Ontario & Western	57,822	—6	31	689,073	—21	37,377	—35	24,117	—53	Not separated			67,854	17	12.7	63,887
Pere Marquette	244,094	9	31	2,809,534	—2	10,382	1	373,708	206	97,953	37	190,928	444,539	0	6.4	826,868
Pittsburg & Shawmut	3,578	97	32	40,263	18	62	—38	.....	..	23,728	..	23,034	26,181	690	5.4	58,258
Pittsburgh & W. Virginia	13,754	..	30	164,410	..	34,875	..	45,185	..	19,528	33	22,224	13,417	..	1.2	127,380
Pittsburg, Shawmut & Nor.	1,890	37	11	63,186	4	218	—19	49	..	223,683	4	143,268	3,292	—69	1.0	37,635
Wabash	147,186	—58	18	2,918,820	8	202,120	226	823,548	24				420,187	100	6.1	824,532
GREAT LAKES REGION	3,634,506	..	26	50,177,437	..	2,128,034	..	8,856,197	..	1,358,762	..	1,999,345	7,544,092	..	11.2	8,082,666
Akron, Canton & Youngstown	6,636	72	23	104,269	0	4,412	—25	10,374	—18	6,816	—8	6,755	7,138	—18	1.9	44,782
Alton & Southern	21,332	..	73	105,807	..	15,898	..	30,738	..	3,522	..	12,167	2,160	..	1.2	21,629
Bessemer & Lake Erie	70,324	..	52	490,916	..	3,506	..	171,250	..	25,653	..	98,591	11,370	..	.5	291,793
Baltimore & Ohio	471,898	37	17	10,055,898	7	1,050,771	0	822,044	—33	159,059	22	447,210	1,339,459	12	8.2	1,966,941
Baltimore & Ohio Chi. Term'l	29,070	70	19	552,375	3	6,578	60	72,918	160	33,021	..	32,450	3,001	—3	.8	46,578
Belt Ry. of Chicago	105,424	64	63	604,056	7	19,764	15	60,019	—67	60,167	11	54,368	84,623	28	5.4	189,090
Central R. R. of New Jersey	172,729	80	20	3,116,456	5	115,883	—24	111,200	37	52,254	3	76,366	191,144	54	11.6	196,936
Chicago & Eastern Illinois	48,759	76	18	1,006,568	8	18,632	8	294,104	13	222,547	11	128,249	221,819	40	14.8	179,633
Chicago & Illinois Midland	3,946	40	9	161,236	8	6,527	51	42,364	..	4,448	—72	84,541	9,768	14	3.5	33,601
Chicago & Western Indiana	20,022	65	37	197,279	17	40,708	20	42,218	15	31,103	16	15,590	31,565	2	6.6	57,169
Chicago, Ind. & Louisville	43,957	121	30	539,546	6	121,223	109	246,590	161	Not sep.	..	Not sep.	183,785	134	22.8	97,434
Detroit, Toledo & Ironton	20,679	34	27	280,708	0	5,210	—31	138,279	92	42,613	214	16,185	131,961	28	15.1	104,575
Elgin, Joliet & Eastern	24,268	—47	10	868,679	19	14,257	38	77,019	74	14,015	24	63,919	47,113	32	1.8	305,623
Long Island	54,526	—6	23	859,011	0	172,337	95	139,916	—6	38,656	..	69,745	22,143	—36	1.9	137,339
Pennsylvania	1,574,160	42	25	22,730,592	11	2,562,851	0	2,413,962	17	634,761	..	2,083,254	4,519,523	57	12.8	4,216,946
Penna.-Read. S. S. Lines	9,379	—26	8	428,697	1	3,353	—12	17,261	—72	44,311	..	10,942	69,898	140	9.9	94,481
Reading	387,926	—11	29	4,897,540	1	357,338	29	103,232	—58	189,961	—8	63,033	452,994	20	17.3	315,266
Western Maryland	94,395	116	36	966,689	11	6,169	—26	233,519	65	15,556	500	65,049	458,111	19	15.6	352,452
Wheeling & Lake Erie	57,063	228	25	828,136	14	53,386	52	111,870	—10	18,762	—75	77,855	191,356	—1	8.3	275,766
CENTRAL EASTERN REGION	3,216,493	..	24	48,794,456	..	4,579,253	..	5,138,877	..	1,597,225	..	3,356,269	7,978,931	..	10.7	8,917,974
Chesapeake & Ohio	379,765	41	28	4,957,139	3	21,107	122	1,455,789	—8	343,857	—30	909,172	631,142	31	14.3	530,844
Norfolk & Western	273,972	79	24	4,160,471*	9	135,099	37	1,544,165*	—43	333,147	32	Not sep.	719,667	26	45.0	189,702*
Richmond, Fred. & Potomac	71,948	140	32	818,523	10	12,080	—68	173,752	150	11,102	—30	7,707	140,430	260	8.9	190,536
Virginian	14,841	23	8	638,829	16	5,459	16	157,556	—2	94,568	19	90,606	277,917	90	16.5	204,628
POCAHONTAS REGION	740,526	..	26	10,574,962	..	173,745	..	3,331,262	..	782,674	..	1,007,485	1,769,156	..	19.2	1,115,710
Ala., Tenn. & Northern	659	..	4	63,771	—14	.....	..	.....	..	2,599	25	11,040	4,415	21	1.1	49,281
Atlanta & West Point lines	36,446	45	49	269,731	2	2,670	—90	107,352	318	15,540	—39	2,560	16,963	—50	3.5	57,827
Atlanta, Birm. & Coast	41,744	—1	55	276,716	14	.....	..	.....	..	9,789	—76	49,541	96,976	154	7.6	152,636
Atlantic Coast Line	1,028,809	64	90	4,177,407	7	32,180	—5	399,922	77	378,419	1	351,560	464,047	166	7.9	700,911
Central of Georgia	61,718	..	17	1,288,482	..	32,562	..	290,933	..	83,522	..	197,518	304,429	..	12.1	302,234
Charleston & W. Carolina	10,730	11	19	206,391	18	1,633	4	22,456	2	11,224	—49	22,191	22,049	—38	3.9	67,104
Clinchfield	10,423	21	13	318,143	13	9,489	—23	46,717	62	6,948	—68	9,496	121,308	—25	11.8	122,033
Columbus & Greenville	2,796	—25	10	98,132	9	528	..	53,332	..	11,364	—25	13,581	3,051	..	.7	51,526
Florida East Coast	200,569	33	85	855,641	21	28,045	—21	4,477	..	329,364	310	168,655	105,905	9	6.5	194,892
Georgia	61,991	16	57	398,898	—1	508	—16	7	—71	25,014	196	111,702	93,304	435	14.0	80,586
Georgia & Florida	12,941	180	37	125,965	9	.....	..	.....	..	10,931	—48	12,711	13,585	4	1.8	91,064
Gulf, Mobile & Northern	28,696	—12	31	341,475	5	3,113	64	143,117	—13	76,134	194	111,836	71,721	480	3.1	279,470
Illinois Central System	588,233	—12	26	8,079,690	5	27,149	—15	547,393	30	344,629	—7	484,835	961,129	65	7.9	1,457,533
Louisville & Nashville	604,452	79	42	5,250,814	9	1,766	..	774,661	—15	269,523	—49	724,203	1,613,012	16	18.7	1,033,980
Mississippi Central	11,623	81	82	51,384	15	.....	..	.....	..	15,175	50	.....	60,452	..	..	.....
Mobile & Ohio	52,891	80	31	616,718	—7	9,805	—85	54,914	170	26,687	3	39,533	67,648	308	2.8	287,111
Nashville, Chat. & St. Louis	201,601	15	75	971,478	4	22,904	—23	256,647	—22	47,648	—35	78,827	262,540	8	15.7	200,359
Norfolk Southern	35,950	8	45	290,037	9	.....	..	.....	..	23,796	98	138,135	91,096	..	3.9	278,732
Seaboard Air Line	480,162	14	54	3,216,420	13	328,677	..	558,645	23	311,012	—22	527,530	536,147	95	6.0	1,071,498
Southern	579,964	—36	27	7,880,555	10	48,647	23	993,770	38	238,153	15	730,222	1,089,466	12	4.5	2,891,062
Tennessee Central	11,929	..	32	132,860	..	60,963	..	32,172	..	18,058	..	21,992	5,989	..	1.2	59,954
SOUTHERN REGION	4,052,344	..	42	34,859,324	..	610,640	..	4,286,515	..	2,240,264	..	3,807,668	5,944,780	..	7.6	9,429,793
Butte, Anaconda & Pacific	339	—42	8	14,350	21	7,241	—45	13,388	210	2,219	..	2,529	12,158	9	6.9	21,183
Chicago & North Western	671,148	—4	38	6,429,775	6	223,562	—45	1,654,085	—19	1,105,015	0	1,502,281	2,773,687	85	19.0	1,749,796
Chicago Great Western	42,089	—1	9	1,666,657	1	46,889	..	465,728	11	48,914	—32	330,288	88,737	12	2.5	427,948
Chi., Milw., St. P. & P.	752,779	47	38	7,270,584	3	762,545	18	1,838,592	—12	Not separated			2,776,145	34	14.8	2,245,044
Chi., St. P., Minn. & O.	131,995	—11	19	2,498,381	10	123,088	..	194,024	3	184,441	17	81,462	381,306	20	10.6	395,141
Duluth, Missabe & I. Range	629,380	170	216	1,061,155	26	17,088	—65	200,239	..	57,870	53	63,536	212,475	78	13.3	191,032
Duluth, S. Shore & Atlantic	23,241	10	31	275,001	3	1,504	—12	19	..	38,079	—40	24,254	13,488	—34	2.0	81,540
Duluth, Winnipeg & Pacific	1,056	..	3	131,219	..	131,490	..	561	..	21,334	..	1,788	32,983	..	8.9	44,440
Great Northern	1,364,769	5	65	7,624,494	5	.....	..	1,001,451	280	696,565	..	376,697	1,070,392	—11	9.0	1,435,528
Green Bay & Western	10,573	27	19	196,269	11	2,743	44	39,439	—64	5,786	—7	52,908	33,138	36	3.1	126,522
Lake Superior & Ishpeming	91,803	5	279	120,606	12	235	—68	7,214	..	56,480	—22	16,953	7,338	2	2.5	34,927
Minneapolis & St. Louis	28,134	—22	22	473,376	—6	75,806	..	7,068	..	109,307	6	30,588	189,749	85	6.9	331,548
Minn., St. P. & S. S. Marie	191,465	—2	30	2,307,809	5	16,017	4	268,798	136	121,275	6	137,921	279,038	—38	4.8	696,411
Northern Pacific	304,340	—5	25	4,464,129	7	109,959	—22	429,731	—44	329,162	—50	299,799	1,618,343	51	16.5	1,179,384
Spokane International	3,976	19	27	54,495	18	283	—17	.....	..	15,956	—30	4,448	8,293	21	3.4	32,711
Spokane, Port. & Seattle	72,008	—14	36	734,510	17	2,875	—14	60,495	—58	49,130	—44	55,084	181,787	..	13.2	165,241
NORTHWESTERN REGION	4,319,095	..	45	35,322,810	..	1,521,325	..	6,180,832	..	2,841,533	..	2,980,536	9,679,057	..	12.7	9,158,396
Alton	49,714	0	16	1,116,842	10	47,626	264	52,002	17	96,458	53	38,922	227,351	189	5.9	462,233
A. T. & S. F. lines	3,772,535	24	87	15,800,973	14	3,481,940	50	4,947,200	12	Not separated			4,271,050	53	16.4	3,030,927
Bingham & Garfield	.....	..	..	25,972	26	3,808	—43	63,685	95	6,851	10	3,494	5,525	10	1.9	33,781
Chicago, Burl. & Quincy	188,057	—60	12	5,544,467	3	651,327	32	1,255,975	51	.....	..	479,902	3,012,767	45	14.6	2,433,940
Chicago, R. I. & P. lines	357,577	16	19	6,734,307	12	369,864	—70	3,188,464	55	Not separated			1,162,150	132	10.7	1,303,553
Colorado & Southern	85,634	140	48	645,948	4	4,667	—38	2,850	31	103,790	—18	42,197	74,283	—12	10.0	88,605
Fort Worth & Denver City	94,437	—40	65	525,190	29	6,531	—43	1,358	—59	27,221	—20	3,862	8,558	—53	1.2	84,809
Denver & Rio Grande West	66,783	16	11	2,280,546	24	513,782	—12	513,264	69	300,296	—25	464,808	436,817	14	8.0	656,963
Nevada Northern	66,697	98	269	90,547	10	6,702	175	1,490	58	5,431	151	2,495	24,911	10	13.4	22,255
Peoria & Pekin Union	8,675	—46	26	119,363	—15	694	..	35,327	..	18,345	141	17,192	5,238	40	3.7	16,914
Southern Pacific	2,698,134	22	47	21,021,708	12	286,639	—47	1,190,332	20	378,081	—12	964,476	1,196,659	10	8.9	1,610,880
Northwestern Pacific Sys.	41,070	—6	39	379,440	13	2,948	8	336	—94	72,110	131	50,700	15,911	19	3.7	51,372
San Diego & Ariz. Eastern	2,624	—6	10	90,192	14	2,722	5	132	—97	6,758	..	3,588	7,303	7	2.1	42,084
Union Pacific System	1,389,131	20	39	13,111,356*	12	2,717,830	—29	2,322,762*	55	Not separated			2,867,063	20	21.4	1,614,395*
Utah	2,171	121	15	68,639	49	29,967	..	665	..	15,075	—34	7,990	64,795	450	37.0	21,194
Western Pacific	131,861	3	31	1,548,439	6	115,953	128	1,188,328	—8	388,456	10	52,418	349,973	150	7.7	538,941
CENTRAL WESTERN REGION	8,955,100	..	47	69,104,329	..	8,243,000	..	15,564,170	..	1,418,872	..	2,132,644	13,730,354	..	13.7	12,012,846
Burlington-Rock Island	1,675	—60	6	97,798	55	1,661	1	.....	..	1,967	—27	2,555	20,625	57	26.5	9,368
Fort Smith & Western	401	—14	4	39,692	—1	4,398	—7	326	..	Not separated			26,879	144	8.0	40,278
Kansas City Southern	284,926	1	105	984,655*	..	79,678	386	436,212*	..	96,706	69	Not sep.	325,193	5	20.0	197,592*
Kansas City Term'l	14,490	..	25	215,040	..	10,774	..	10,103	..	439	..	7,191	31,870	..	12.7	30,024
Louisiana & Arkansas	117,857	10	123	351,295	22	1,813	—7	2,698	150	66,172	—35	555,873	105,504	—22	7.8	161,867
Louisiana & Arkansas	117,857	10	123	115,463	27	.....	..	.....	..	17,407	—30	21,895	33,338	77	8.5	47,245
Missouri & Arkansas	2,051	120	8	94,019	..	.....	..	.....	..	384	—56	132	3,439	—36	.6	68,437
Missouri-Kansas-Texas	106,956	—53	17	2,334,579	14	94,925	—47	235,182	35	Not separated			511,099	27	10.2	604,779
Missouri Pacific System	1,126,902	14	52	7,797,072	10	102,507	—5	1,407,048	2	451,136	—25	697,476	1,679,383	20	7.6	2,663,096
Gulf Coast Lines	259,978	26	100	945,720	25	24,612	72	96,755	—13	130,456	—25	94,419	61,326	—42	2.3	338,379
International-Great Nor.	438,767	7	155	1,035,963	35	49,281	6	147,144	66	119,380	10	60,910	188,411	—5	14.7	153,765
St. Louis-San Francisco	374,048	65	31	4,443,870	14	358,763	—33	907,821	23	Not separated			1,527,213	69	10.8	1,692,195
St. Louis Southwestern	527,146	44	141	1,367,942	30	71,387	42	247,919	168	116,555	73	47,428	322,871	85	9.2	420,620
Term'l R. R. Ass'n of St. L.	28,506	—5	14	755,991	18	69,629	73	47,204	—27	4,523	—59	10,102	25,264	25	5.6	54,273
Texas & New Orleans	848,499	23	93	3,310,131	31	79,985	12	343,206	109	386,932	—17	274,701	857,728	38	14.4	713,198
Texas & Pacific	1,017,890	12	195	1,908,022*	..	349,249	37	308,287*	..	Not separated			369,913	85	..	2,285*
Wichita Falls & Southern	1,755	43	23	27,472	11	.....	..	.....	..	67	..	409	3,808	150	1.0	43,150
Wichita Valley	1,146	—32	12	34,129	3	.....	..	.....	..	1,701	—18	1,425	806	—92	.4	21,618
SOUTHWESTERN REGION	4,477,265	..	69	23,949,698	..	1,224,769	..	3,946,008	..	1,143,922	..	1,618,778	5,841,748	..	10.4	6,727,703
Total Class I Equated	$30,811,956	..	39	$286,070,880	..	$13,111,252	..	$42,813,445	..	$18,012,052	..	$23,404,812	$54,622,738	..	11.5	57,110,654

* Estimated.

Carried by Class I Railroads in 1937

Used 1937	Used Inc. %	Stores Stock — On Hand Dec. 31	On Hand Inc. %	On Hand Months' stock	Used 1937	Used Inc. %	Total—Less Scrap — On Hand Dec. 31	On Hand Inc. %	On Hand Months' stock	Used 1937	Used Inc. %	Scrap — On Hand Dec. 31	Scrap — Sold 1937	Total including scrap Dec. 31	Road
$91,129	..	$569,966	..	9.1	$751,916	..	$904,224	..	7.4	$1,460,710	..	$12,258	$118,170	$916,482	Bang. & Aroos.
62,758	—18	1,176,191	6	6.7	2,095,871	20	1,535,769	9	4.0	4,553,727	10	22,588	172,891	1,558,357	B. & A.
549,434	36	2,472,868	7	5.3	5,645,379	8	3,936,053	—5	4.5	10,444,167	5	39,554	167,205	3,975,607	B. & M.
91,031	—22	403,224	37	6.2	787,426	—14	631,446	37	4.6	1,656,133	—8	9,116	140,942	640,562	C. Vt.
880,132	1	906,885	2	5.1	2,152,459	23	1,269,581	2	4.3	3,560,138	12	12,070	85,580	1,281,651	Me. Cent.
442,025	—24	4,322,229	31	4.1	12,597,245	17	6,220,163	25	3.9	18,931,943	11	137,994	2,124,492	6,358,157	N. Y. N. H. & H.
49,057	..	240,518	..	4.0	710,927	..	405,178	..	4.0	1,200,108	..	5,252	21,042	410,530	Rutland
1,665,566	..	10,091,881	..	4.9	24,741,223	..	14,902,414	..	4.3	41,806,926	..	238,932	2,830,322	15,141,346	
60,360	—12	192,902	3	4.2	541,764	18	329,056	27	3.5	1,107,636	6	1,595	16,620	330,651	Ann Arbor
27,919	45	40,017	3	7.4	64,707	..	52,382	6	4.5	139,275	..	4,240	12,368	56,622	Camb. & Ind.
510,024	16	1,435,586	10	4.6	3,835,272	15	2,658,643	24	4.6	6,878,676	17	42,786	287,568	2,701,429	D. & H.
249,852	—23	1,679,890	27	3.7	5,373,312	—8	2,206,682	33	2.4	10,961,448	—3	58,677	750,000	2,265,359	D. L. & W.
22,221	0	131,318	4	13.5	117,075	30	177,889	—5	10.0	212,929	12	1,382	19,809	179,271	Detr. & Mack.
29,032	—13	69,916	14	7.1	118,928	—22	104,749	—1	4.0	311,736	—23	2,022	4,682	106,771	D. & T. S. L.
730,624	—2	2,471,743	15	2.9	10,247,692	17	3,549,957	14	2.5	18,119,049	17	370,282	2,397,714	3,920,239	Erie
440,432	—3	1,275,805	31	3.9	3,932,631	17	1,992,083	31	3.5	6,867,092	10	80,650	454,078	2,072,733	G. T. W.
96,954	88	65,290	32	7.7	102,765	17	114,350	42	4.9	279,154	14	607	20,766	114,957	L. & H. R.
26,188	—2	196,424	—11	4.0	578,832	20	382,963	3	4.8	949,547	9	17,111	114,287	400,074	L. & N. E.
86,745	—37	2,549,635	48	4.9	6,241,677	..	3,223,704	32	3.5	10,975,061	—3	101,573	629,245	3,325,277	L. V.
82,839	..	179,699	8	15.5	138,533	—48	205,396	18	5.8	420,121	10	2,544	5,965	207,940	Monong.
18,057	30	131,022	13	7.1	222,678	—11	134,337	3	4.3	370,165	—4	6,496	9,817	140,823	Montour
3,399,936	7	20,025,300	23	5.3	45,495,792	15	27,220,426	23	4.4	73,751,160	13	604,463	10,250,928	27,824,889	N. Y. C.
432,923	24	1,123,745	20	3.3	4,137,560	2	1,778,303	29	2.5	8,639,757	5	70,079	656,418	1,848,382	N. Y. C. & St. L.
63,887	7	447,935	..	7.6	709,770	—6	610,988	—2	4.9	1,486,847	—16	12,739	222,411	623,727	N. Y. O. & W.
826,868	28	907,434	5	3.2	3,387,082	25	1,704,402	6	2.7	7,588,120	17	32,915	363,150	1,737,317	P. M.
58,258	68	90,859	20	17.2	63,281	5	129,726	34	9.0	173,952	18	5,371	6,347	135,097	P. & S.
127,380	..	399,907	..	4.2	1,136,764	..	485,681	..	3.9	1,496,773	..	7,356	121,927	493,037	P. & W. Va.
37,635	—1	65,935	—10	9.1	87,110	..	90,863	..	5.2	210,204	..	5,301	42,869	96,164	P. S. & N.
824,532	1	1,843,203	33	3.0	7,342,800	30	2,836,379	27	2.8	12,052,968	22	15,476	258,852	2,851,855	Wabash
3,082,866	..	35,323,565	..	4.5	93,876,025	..	49,988,959	..	3.7	162,991,670	..	1,443,665	16,646,821	51,432,624	
44,782	—17	78,588	9	4.9	192,785	—11	103,590	5	3.4	358,965	—8	4,593	7,652	108,183	A. C. & Y.
21,629	..	46,572	..	3.6	141,219	..	89,484	..	3.4	311,560	..	1,819	6,164	91,303	A. & S.
291,793	..	577,215	..	4.1	1,694,382	..	688,068	..	3.0	2,746,932	..	66,345	215,318	748,413	B. & L. E.
1,966,941	—4	8,962,022	33	3.2	33,543,554	37	11,983,209	41	3.1	46,835,645	25	314,116	4,691,763	12,297,325	B. & O.
46,578	—7	274,498	40	1.5	2,167,750	81	346,168	39	1.4	2,872,011	57	12,040	180,917	358,208	B. & O. C. T.
189,090	96	280,650	48	7.1	474,590	49	550,628	40	4.8	1,382,122	37	46,494	57,561	597,122	Belt
196,936	16	1,230,051	9	3.9	3,791,123	14	1,762,061	13	2.9	7,292,081	11	112,799	545,142	1,874,860	C. of N. J.
179,633	17	631,389	33	3.1	2,443,548	11	1,143,146	30	3.4	4,052,102	11	79,332	246,051	1,222,478	C. & E. I.
33,601	32	283,177	28	4.5	745,509	40	317,866	22	3.6	1,017,251	40	22,778	43,067	330,644	C. & I. M.
57,169	15	252,141	3	6.0	503,366	—7	375,539	8	5.5	815,532	1	21,127	63,116	396,666	C. & W. I.
97,434	11	706,339	26	8.5	1,000,500	—43	1,055,304	46	6.7	1,884,070	—23	43,680	355,149	1,098,984	C. I. & L.
104,575	9	354,071	30	5.3	799,166	..	554,534	35	5.0	1,338,913	10	4,729	29,920	559,263	D. T. & I.
305,623	9	862,094	1	3.6	2,891,134	45	961,757	—2	2.7	4,206,374	36	87,756	472,079	1,049,503	E. J. & E.
137,339	18	1,179,032	43	3.9	3,616,852	7	1,466,694	45	3.6	4,822,863	5	8,832	113,920	1,475,526	Long Island
4,216,946	32	33,431,044	40	4.4	94,085,662	21	42,722,339	37	4.1	125,530,416	19	2,188,045	8,482,871	44,910,384	Pennsylvania
84,481	111	113,836	22	4.7	285,859	10	240,777	28	3.5	827,240	1	3,604	20,835	244,381	P. R. S. S.
315,266	19	4,251,924	27	6.6	7,714,777	52	5,640,143	19	5.1	13,093,848	25	143,919	824,558	5,784,062	Reading
352,452	—3	1,136,885	18	6.9	1,946,095	..	1,711,566	20	5.7	3,563,804	6	102,446	406,072	1,814,012	W. Md.
275,766	—2	822,817	26	2.8	3,537,382	14	1,143,384	17	2.8	4,831,009	11	5,038	269,488	1,148,422	W. & L. E.
8,917,974	..	55,474,345	..	4.1	161,575,153	..	72,846,247	..	3.8	227,782,729	..	3,263,492	17,031,043	76,109,739	
530,844	—7	2,502,962	7	2.3	13,297,541	14	3,878,833	8	2.2	21,150,485	9	85,149	1,951,966	3,963,982	C. & O.
189,702*	—77	5,398,442	32	5.5	11,601,644*	—15	6,860,327	32	4.7	17,495,982*	—17	69,364	.....	6,929,691	N. & W.
190,536	94	599,466	8	6.1	1,184,050	—5	835,026	23	4.2	2,374,568	9	Not sep.	Not sep.	835,026	R. F. & P.
204,628	2	1,749,913	22	7.0	3,033,113*	12	2,142,698	27	6.2	4,124,732*	26	15,747	415,814	2,158,445	Va.
1,115,710	..	10,250,783	..	4.2	29,116,348	..	13,716,884	..	4.2	45,145,767	..	170,260	2,367,780	13,887,144	
49,281	—3	32,242	12	2.0	130,652	47	39,825	7	1.8	254,744	18	.....	.....	39,825	A. T. & N.
57,827	—5	292,615	156	7.0	503,247	410	364,234	64	4.6	940,717	107	1,333	61,156	365,567	A. & W. P.
152,636	21	250,346	10	5.1	587,780*	..	398,855	14	4.5	1,066,673*	..	6,262	7,319	405,117	A. B. & C.
700,911	—5	1,739,025	9	2.8	7,000,672	32	3,642,480	30	3.5	12,630,472	21	64,773	588,968	3,707,253	A. C. L.
302,234	..	919,461	..	4.3	2,558,965	..	1,401,692	..	3.6	4,638,132	..	23,903	295,585	1,425,595	Cent. of Ga.
67,104	—4	108,474	42	4.8	270,334	41	153,750	6	3.1	588,476	11	10,024	17,392	163,774	C. & W. C.
122,033	8	284,254	33	4.7	725,325	17	432,422	3	4.2	1,221,714	16	18,110	122,471	450,532	Clinch.
51,526	26	132,163	18	10.8	147,016	—29	149,903	27	4.9	363,587	6	7,865	8,881	157,768	Col. & Green.
194,892	45	1,275,615	17	12.4	1,244,721	21	1,939,498	35	9.4	2,468,386	31	53,411	43,952	1,992,909	F. E. C.
80,586	44	309,998	256	7.1	523,242	..	490,815	192	5.3	1,114,435	90	1,752	64,243	492,567	Ga.
91,064	4	81,234	12	6.5	149,606	8	118,691	10	3.7	379,346	6	2,864	12,398	121,555	Ga. & Fla.
279,470	61	428,775	15	6.4	803,796	38	608,439	37	4.3	1,679,694	34	25,276	209,738	633,715	G. M. & N.
1,457,533	8	6,445,907	28	5.1	15,171,436	12	8,367,047	25	3.9	25,740,887	11	820,908	1,892,527	9,187,955	I. C.
1,033,980	8	5,964,998	14	5.3	13,520,964	10	8,453,751	4	4.7	21,304,622	9	350,700	1,339,988	8,804,451	L. & N.
.....	..	50,694	7	..	.....	..	137,344	93	..	.....	..	2,321	.....	139,665	Miss. Cent.
287,111	—2	868,893	35	7.9	1,312,732	—14	1,025,924	31	5.3	2,311,008	—12	204,610	103,865	1,230,534	M. & O.
200,359	—2	1,150,302	8	7.5	1,855,478	11	1,684,995	6	6.0	3,362,789	5	Not Separated		1,684,995	N. C. & St. L.
278,732	72	325,029	14	7.2	539,705	..	475,871	7	4.6	1,246,609	..	6,357	39,500	482,228	N. S.
1,071,498	4	3,030,841	29	5.5	6,604,955	16	4,686,839	35	4.7	11,979,048	15	248,685	186,607	4,935,524	S. A. L.
2,891,062	6	5,699,937	35	4.0	17,243,420	22	7,656,167	21	3.1	29,739,029	18	512,173	2,321,745	8,168,340	Southern
59,954	..	201,681	..	8.0	302,578	..	298,620	..	6.5	549,556	..	3,310	43,075	301,930	Tenn. Cent.
9,429,793	..	29,541,790	..	5.0	71,196,624	..	42,389,818	..	4.1	123,579,924	..	2,362,316	7,319,810	44,752,134	
21,183	73	219,285	30	5.4	463,223	155	231,242	18	5.4	514,673	144	2,338	14,564	235,580	B. A. & P.
1,749,796	12	6,807,310	29	4.8	16,847,515	20	11,580,722	30	4.9	28,183,452	13	192,823	1,595,858	11,773,545	C. & N. W.
427,948	20	550,022	36	2.7	2,485,197	43	776,651	29	1.7	5,375,738	23	114,273	7,900	890,924	C. G. W.
2,245,044	—35	7,369,535	26	5.4	16,372,080	7	11,661,004	29	5.0	27,726,300	—1	279,200	1,050,684	11,940,204	C. M. St. P. & P.
395,141	18	881,635	44	4.3	2,443,209	23	1,702,465	37	3.6	5,612,317	14	27,356	185,911	1,729,821	C. St. P. M. & O.
191,032	34	676,259	44	3.6	2,258,173	36	1,593,072	75	5.0	3,774,135	39	32,925	149,337	1,625,997	D. M. & I. R.
81,540	21	150,432	—13	6.1	295,875	52	226,744	—19	4.0	676,689	22	3,551	74,421	230,295	D. S. S. & A.
44,440	..	80,827	..	9.7	100,083	..	267,690	..	11.5	278,091	..	2,705	13,369	270,395	D. W. & P.
1,435,528	11	5,985,880	26	6.4	11,218,028*	45	9,117,606	..	3.3	21,656,198*	..	Not separated		9,117,606	G. N.
126,522	—9	66,096	—3	8.2	96,524	—3	118,336	7	2.8	511,662	—18	3,842	7,052	122,178	G. B. & W.
34,927	9	150,101	—14	9.3	193,571	20	305,957	—13	9.8	373,271	23	9,582	14,215	315,539	L. S. &. I.
331,548	14	517,921	14	6.7	929,916	—12	920,916	32	6.3	1,772,496	—8	23,406	65,796	944,322	M. & St. L.
696,411	—14	1,257,725	6	7.2	2,108,439	4	1,865,520	—5	4.0	5,519,378	5	85,229	304,984	1,950,749	Soo
1,179,384	—6	5,957,555	36	5.3	13,430,015	18	8,319,359	26	5.0	19,803,058	11	546,318	666,422	8,865,677	N. P.
32,711	6	38,574	7	6.2	75,121	8	67,082	—3	4.8	166,775	11	2,165	1,590	69,247	Spokane Int.
165,241	23	511,093	50	10.8	567,317	5	816,893	54	6.2	1,582,647	8	29,909	178,363	846,802	S. P. & S.
9,158,396	..	31,210,250	..	5.4	69,884,206	..	49,571,259	..	4.5	123,526,780	..	1,355,622	4,330,466	50,926,881	
462,233	2	589,139	42	1.4	4,904,505	24	1,010,288	63	1.8	6,574,504	6	40,736	325,183	1,051,024	Alton
3,030,927	—1	14,481,420	68	6.3	27,679,305	23	26,106,945	55	6.1	51,458,405	17	106,556	1,664,145	26,113,501	A. T. & S. F.
33,78	—26	41,392	5	10.1	49,530	—3	57,576	6	3.9	176,462	6	1,343	7,684	58,919	Bing. & Gar.
2,433,940	8	6,314,946	20	2.7	27,852,209	55	10,167,097	23	3.3	37,566,493	41	800,570	863,006	10,967,667	C. B. & Q.
1,303,353	36	5,112,888	6	5.9	10,319,556	—3	7,002,479	12	3.9	21,545,880	9	400,185	2,970,366	7,402,664	C. R. I. & P.
88,605	—22	264,232	16	2.9	1,083,221	34	532,606	9	3.4	1,862,821	17	13,756	153,353	546,362	C. & S.
84,809	16	449,827	18	5.6	957,987	44	586,574	—2	4.5	1,573,206	37	18,720	124,126	605,294	Ft. W. & D. C.
656,963	9	3,304,479	29	6.2	6,360,676	13	4,622,157	16	5.5	10,276,257	18	31,047	620,706	4,653,204	D. & R. G. W.
22,255	10	70,742	11	10.0	84,123	32	174,483	85	10.4	200,910	20	1,188	1,351	175,671	Nev. Nor.
16,914	33	89,577	19	2.6	403,240	17	122,529	11	2.4	592,036	17	8,500	26,158	131,029	P. & P. U.
1,610,880	22	8,398,279	44	4.1	24,633,852	24	12,957,792	29	3.1	50,221,248	16	578,199	2,747,412	13,535,991	S. P.
51,372	111	110,356	24	3.1	424,344	10	242,395	34	3.2	906,192	19	5,590	45,720	247,985	N. W. Pac. Sys.
42,084	11	33,747	—18	4.8	85,380	19	53,154	—3	2.9	221,376	11	1,494	10,068	54,648	S. D. & A. E.
1,614,395*	—27	23,232,495	66	8.1	34,530,264*	60	30,206,519	41	7.0	51,579,117*	38	291,723	908,035	30,498,242	U. P.
21,194	—42	174,758	30	17.3	191,916	59	286,766	65	15.7	220,304	38	367	5,360*	287,133	Utah
538,941	52	1,887,990	26	11.5	1,966,921	54	2,874,233	33	6.5	5,295,047	18	43,383	171,169	2,917,616	W. P.
12,012,846	..	64,556,267	..	5.5	141,456,869	..	96,903,593	..	4.8	240,270,258	..	2,343,357	10,643,842	99,246,950	
9,368	—89	37,693	93	10.4	43,223	—26	63,621	55	5.0	152,944	—8	240	1,022	63,861	B.-R. I.
40,278	11	143,190	—9	19.6	86,292	82	174,868	1	12.6	166,588	34	271	864	175,139	Ft. S. & W.
197,592*	..	565,857	—1	5.5	1,237,573*	..	1,352,360	10	5.7	2,856,032*	..	35,842	.....	1,388,202	K. C. S.
30,024	..	144,373	..	2.6	655,339	..	201,746	..	2.6	917,697	..	6,206	13,431	207,952	K. C. Term'l
161,807	15	516,799	25	7.5	827,094	20	808,145	7	5.1	1,898,767	37	67,073	149,676	875,218	L. & A.
47,245	—36	121,347	—7	12.5	115,977	36	196,864	9	7.8	300,580	—10	1,344	32,878	198,208	L. & A. & T.
68,437	18	44,433	—9	8.3	64,118	10	50,307	—10	2.6	226,706	83	4,330	.....	54,637	Mo. & Ark.
604,779	10	1,753,313	28	4.8	4,373,321	4	2,467,116	13	3.9	7,547,861	8	Not separated		2,467,116	M-K-T
2,663,096	6	7,935,991	21	5.4	17,849,763	6	11,295,919	16	4.5	30,414,855	8	151,075	2,235,885	11,446,994	M. P.
338,379	77	714,013	27	4.3	1,968,648	9	1,190,385	12	4.2	3,443,323	18	24,294	31,962	1,214,679	G. C. L.
153,765	1	1,037,858	—1	5.5	2,218,953	7	1,833,697	1	6.1	3,616,735	17	43,221	419,504	1,876,918	I.-G. N.
1,692,195	0	3,381,135	34	4.3	9,353,451	10	5,641,159	34	4.1	16,397,337	11	76,182	.....	5,717,341	St. L.-S. F.
420,620	12	1,136,311	38	4.8	2,831,677	8	2,174,270	46	5.3	4,915,586	17	Not separated		2,174,270	St. L. S. W.
54,271	38	368,145	23	4.2	1,040,411	23	496,067	25	3.1	1,907,979	18	16,154	72,244	512,221	T. of St. L.
713,188	23	2,457,938	17	3.5	8,441,927	18	4,631,082	17	4.2	13,083,153	23	186,692	486,638	4,817,774	T. & N. O.
2,785*	..	2,557,404	22	8.0	4,024,670*	..	4,294,456	21	8.2	6,243,764*	..	Not separated		4,294,456	T. & P.
43,330	15	19,084	0	..	.....	..	24,714	5	..	.....	..	Not separated		24,715	W. F. & S.
21,618	25	18,403	40	5.1	42,735	21	22,056	—17	2.6	99,907	22	548	1,121	22,604	W. V.
6,727,713	..	21,182,332	..	5.0	50,987,571	..	33,870,036	..	4.7	87,129,756	..	545,957	2,993,759	84,415,993	
57,110,674	..	$256,998,139	..	4.8	$641,617,409	..	$373,556,136	..	4.2	$1,051,017,200	..	$12,350,675	$68,522,677	$385,912,811	

were larger on 45 roads and smaller on 42 roads and the consumption during 1937 was larger on 53 roads and smaller on 27 roads. Crosstie stocks showed increases on 84 roads and decreases on 34 roads, and the consumption of crossties in 1937 showed increases on 71 roads and reductions on 37 roads. Storehouse inventories reflected increases on 100 roads and reductions on 11 roads, and the consumption of storehouse materials reflected increases on 83 roads and reductions on 19 roads.

Turnover figures are included in the analysis because of the insistence with which some railway supply officers urged their superiority over other standards of measurement in making comparisons—a position from which these same officers have had reason to retreat somewhat since 1929 when the consumption of materials was less subject to interruptions by forces beyond the control of railway personnel than at present. Such figures alone are admittedly far from satisfactory at any time with such material as rails and ties which are not liquidated uniformly during the year, and which might be used rapidly during normal track improvement programs. The wide variations between the rate of turnover of stores stock on different roads during last year also shows that they can result in misleading comparisons unless studied in the light of other information. The regional averages are less likely to be distorted.

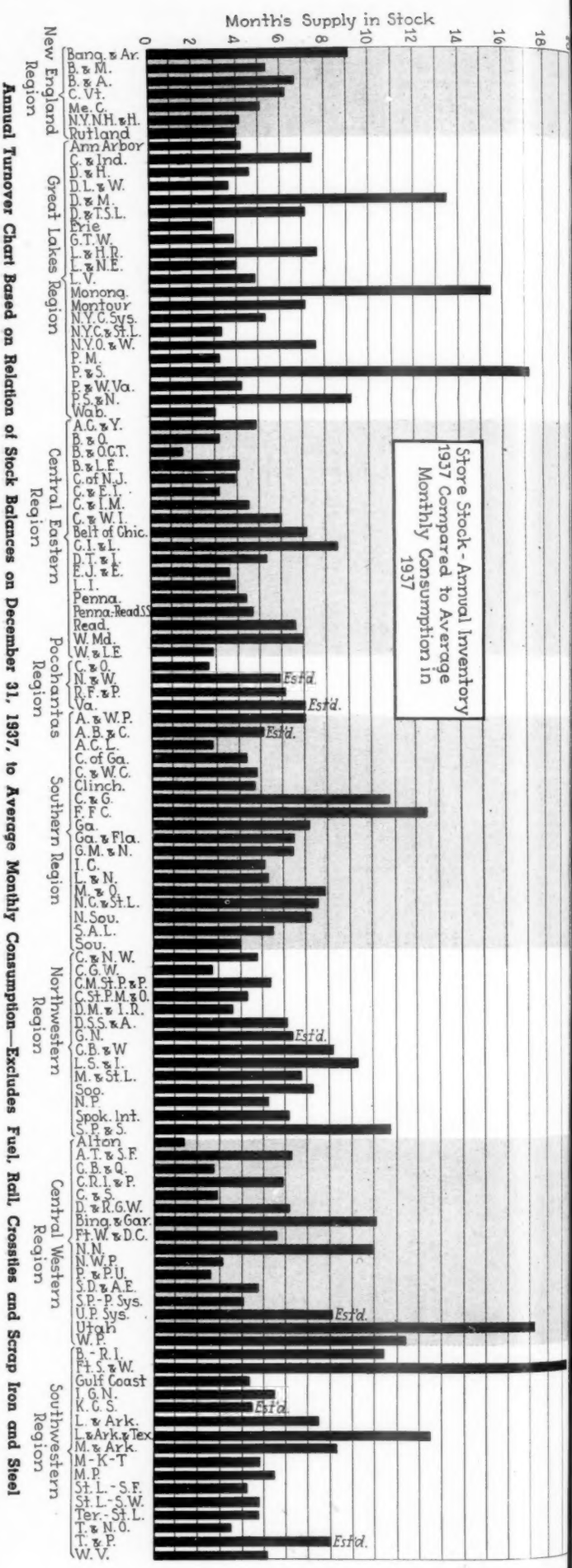
Fuel stocks represented a 24-days' supply in the Pocahontas region, as compared with 69 days in the Southwestern region. The average regional turnover of crossties was highest in the Southern region where the inventory on December 31 represented a 7.6-months' supply, as compared with 5.7 months in 1936, based on the average monthly consumption during the 12 previous months; while the crosstie inventory in the Central Eastern region averaged a 19.2-months' supply, as compared with 9.3 months in 1936. These figures are compared with a 15.4-months' supply for the New England region, an 11.2-months' supply for the Great Lakes region; 12.7 months for the Northwestern region; 13.7 months for the Central Western region and 10.4 months for the Southwestern region.

Turnover Highest In East

Inventories of stores stock reflected a 4.1-months' supply in the Central Eastern region, as compared with 3.8 months in 1936; a 4.9-months' supply in the New England region, as compared with 4.6 months in 1936; a 4.5-months' supply in the Great Lakes region, as compared with 4.2 months in 1936; a 4.2-months' supply in the Pocahontas region, as compared with 3.4 months in 1936; a 5.0-months' supply in the Southern region, as compared with 4.7 months in 1936; a 5.4-months' supply in the Northwestern region, as compared with 4.6 months in 1936; a 5.5-months' supply in the Central Western region, as compared to 5.0 months in 1936; and a 5.0-months' supply in the Southwestern region, as compared with 4.2 months in 1936.

Iron and steel scrap on hand at the close of 1937 represented 3.2 per cent of the total inventory, as compared with 3 per cent at the close of 1936, and, when compared to sales, the combined inventory of iron and steel scrap represented a turnover of scrap six times a year. Aggregate crosstie stocks on December 31, including ties at treating plants and unapplied ties on the line of road, were equivalent to approximately $230 per mile of road, and the combined book value of new rail on hand was equivalent to approximately $55 per mile of road. For further comparisons with previous years, reference is made to the *Railway Age* of April 24, 1937.

Annual Turnover Chart Based on Relation of Stock Balances on December 31, 1937, to Average Monthly Consumption—Excludes Fuel, Rail, Crossties and Scrap Iron and Steel



Railway Message Next Week

President expects to transmit recommendations to Congress about April 12—Meanwhile speculation continues as to Splawn committee's conclusions

WASHINGTON, D. C.

PRESIDENT ROOSEVELT said at his April 5 press conference that it will be next week—perhaps about Tuesday—before he transmits to Congress his special railroad message, which is to be accompanied by the report of his railroad committee composed of Interstate Commerce Commission Chairman Walter M. W. Splawn and Commissioners Joseph B. Eastman and Charles D. Mahaffie. At the same time the President indicated his opposition to a federal subsidy for railroads, which he revealed was among the subjects mentioned when all phases of the railroad problem were discussed at his April 4 conference with representatives of management and labor.

Pending the transmission of his message to Congress the President would not say whether or not he would recommend legislation. Meanwhile on the day after the press conference came newspaper accounts of what purported to be a summary of the recommendations submitted by the Splawn-Eastman-Mahaffie committee. These accounts listed the following: Government guarantee of railroad bonds issued as a result of "voluntary" reorganizations for the purpose of scaling down capital structures; government loans for equipment purchases; government loans for other purposes without an I. C. C. finding that the carriers involved do not need reorganization; a federal court with jurisdiction over railroad reorganizations; elimination of land-grant rates on government traffic; regulation of all forms of transportation by a single federal agency; creation of a board to carry on the work of the former federal co-ordinator of transportation. The committee was also reported to have discussed the effect of wage reductions without, however, advancing any specific pay-cut proposal.

Splawn Refuses Comment on "Recommendations"

Chairman Splawn refused to comment on the foregoing, taking the position that members of his committee as government officials had done a job on assignment from the President. The material submitted is now the President's, Mr. Splawn added; and he would not identify a true copy of the report if it were placed before him in advance of its release by the White House. That copies of the report were supplied to the 14 original White House conferees was indicated when George M. Harrison, chairman of the Railway Labor Executives' Association, revealed that he had one.

Another "plan," said to have been embodied in a memorandum prepared by Laughlin Currie, Federal Reserve Board economist, would contemplate the formation of a federal railroad equipment corporation for the purpose of acquiring rolling stock to be leased to the railroads. Like Chairman Splawn, Mr. Currie refused to comment on reports in this connection.

On the subsidy question President Roosevelt said that he had pointed out to the labor and management representatives how no one yet knows what will be the final solution of the general transportation problem; and in the absence of a national policy approved by Congress he did not think the federal government could afford to pay subsidies to railroads. He went on to speculate on the ramifications of a railroad subsidy, and wondered where such a policy could be stopped if similar demands were made on behalf of other industries, several of which he listed by way of example. The latter, along with the railroads, the President added, are supported by private capital; and he hoped they would remain so.

One of the President's examples was the inter-urban trolley lines. Their decline, he pointed out, was a serious thing from the standpoint of labor and capital employed in the industry. Yet the federal government did not subsidize them—if it had we might still have inter-urban trolleys.

Asked whether he thought that wartime federal control was a fair test of government performance as a railroad operator, the President replied that it was difficult to give either an affirmative or negative answer. Wartime operations, he explained, were markedly different from those of peace times. Mr. Roosevelt did say, however, that the United States Railroad Administration did certain things which some railroad executives think should now be done. In this connection the President mentioned consolidated ticket offices and pooling of freight cars. He was not familiar with the technicalities of the latter, but nevertheless recalled that during the war it brought important economies.

Sudsidy Not Management's Idea

The subsidy idea was publicized on April 4, the day of President Roosevelt's conference with the management and labor committees, as a proposal upon which the two groups were in agreement. It was subsequently learned, however, that management and labor went to the White House with different proposals; and J. J. Pelley, president of the Association of American Railroads, who headed the management committee, indicated that the subsidy idea did not originate on his side. The April 4 conference was held in response to requests from management and labor for an opportunity to discuss the Splawn-Eastman-Mahaffie recommendations with the President before he prepared his message to Congress.

In addition to Mr. Pelley, the management group included F. E. Williamson, president of the New York Central; S. T. Bledsoe, president of the Atchison, Topeka & Santa Fe; and E. E. Norris, president of the Southern. Labor was represented by Chairman Harrison of the Railway Labor Executives' Association; D. B. Robertson, president of the Brotherhood of Locomotive Firemen & Enginemen; A. J. Manion, president of the Order of Railroad Telegraphers; and S. H. Hogan, president of the Marine Engineers.

As the conference broke up Messrs. Harrison and Pelley refused to comment, except to say that the

Splawn-Eastman-Mahaffie report and "the general economic situation" had been discussed. Also, the conferees left the White House with the idea that the President's railroad message would be forthcoming this week when they also expected the report to be made public. It was on the following day, as stated above, that the President said he did not expect to act until next week.

Roads Still Firm for Wage Cuts

Mr. Harrison refused to comment on the subsidy plan, which was described as contemplating federal subsidization to the extent necessary to maintain railway employment and payrolls at present levels; and figures as high as $465,000,000 a year were mentioned. Because Mr. Pelley later the same day indicated that management is standing firm on its position that a general reduction in wages is the only feasible step that can be taken in the present financial crisis, it is generally believed that the subsidy idea was manoeuvre of labor to forestall a pay cut. Along similar lines is a proposal of Senator Schwellenbach of Washington to make "employment" loans to selected railroads.

In outlining the management position on the necessity for wage cuts Mr. Pelley left the impression that the railroad industry generally supports no such ideas as the various suggestions for government subsidies or loans now being discussed. As Mr. Pelley sees it the immediate railroad problem offers two alternatives—the carriers must increase their revenues or they must decrease their expenses. The former, he explained, is possible, in the absence of the necessary traffic rise, only through increased rates. But, since the I. C. C. failed to allow the "15 per cent" increase asked, the alternative of reduced costs must be adopted; and wages comprise about 60 per cent of operating expenses. Meanwhile it is understood that traffic committees have been working on the other alternative in an endeavor to realize such additional revenue as can be "mined" out of those sections of the rate structure which have been depressed by the publication of competitive rates. In this connection the co-operation of other transportation agencies is undoubtedly being sought in order to preserve the present relative set-up on the higher level.

In addition to his above-mentioned comments, Mr. Pelley pointed out that the $2,000,000 deficit in February was the first February deficit reported by the railroads since 1921; and he does not expect March results to be much better. Questioned about large-scale R. F. C. loans to roads bordering on bankruptcy, Mr. Pelley said he doubted the advisability of such action, which could only mean the piling up of additional debt for the carriers concerned. In that there is no solution of the railroad problem, he added. Mr. Pelley conceded the efficacy in that connection of past R. F. C. loans but he nevertheless indicated that he thought it better that the roads which could not meet their obligations be reorganized. The A. A. R. president doubted the constitutionality of legislation declaring an interest moratorium, adding that such would merely delay the day of reckoning and pile up additional railroad debt.

Consolidation Takes Time

On the matter of consolidations it was Mr. Pelley's view that, while they offer a source of some savings, they cannot be accomplished in any short period of time. The railroads, he explained, could expect nothing from consolidations this year. In view of the President's forthcoming railroad message, Mr. Pelley said that no further steps would be taken toward wage reductions until it is determined just what the Administration intends to do. Meanwhile, however, the labor committee appointed in response to management's request for conferences on general railroad problems met again with the management group in Washington on March 31. No announcement was made following that meeting, aside from that in connection with management's refusal to go along with labor on federal unemployment insurance plans.

Chairman Jesse H. Jones of the Reconstruction Finance Corporation, who was a member of the original White House railroad conference, called on President Roosevelt on April 5. Upon leaving the White House Mr. Jones predicted that the carriers would get a traffic increase, which he said they need more than additional loans. Meanwhile, however, R. F. C. money is available up to the amount the railroads could give security for. The R. F. C. chairman expressed doubt that important railroad legislation could be enacted at the present session of Congress. Railroad bills, he pointed out, are not usually "a short order job," adding, however, that the easing of the bankruptcy laws would be helpful.

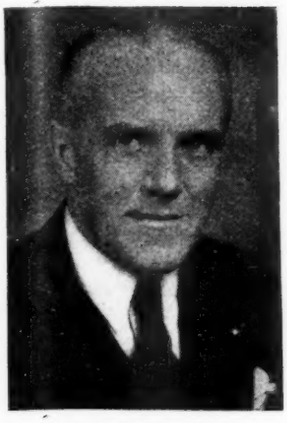
Wheeler Would Scale Down Capitalization

Later the same day Chairman Wheeler of the Senate Interstate Commerce Committee, which must handle rail legislation in the upper body, asserted that the carriers must scale down their capitalization if they would avoid government ownership. Recalling that he had introduced a government-ownership bill sometime ago the Montanan asserted that federal operation would be preferable to government guarantees of billions in railroad bonds. However, he went on, "I don't want to see the government take over railroads and pay anything like 100 cents on the dollar for securities on the basis of I. C. C. valuations. It is apparent that the railroads could not earn interest and dividends on the valuations fixed by the I. C. C. There are a lot of stockholders and bondholders who would now like to see the government take over the roads and pay in the neighborhood of face value for outstanding securities. It seems to me ridiculous to think that some of the railroads can pay the fixed charges that they are now faced with and the sooner security holders recognize this fact and stop trying to get new government money into the carriers, the better it will be for them as well as the railroads and the general public."

Prior to the above-mentioned publication of what purported to be a summary of the Splawn-Eastman-Mahaffie recommendations, some speculation on such recommendations had centered about what purported to be a copy of a memorandum submitted by Commissioner Eastman at one of the two White House meetings of the original railroad conference. Mr. Eastman refused to discuss such a document which was described as one recommending a government agency to be "on the job continuously, planning and promoting improvements, advising President and Congress, and working in close co-operation with all carriers." The new agency would first be created on a temporary basis, but "could develop into permanent department of transportation."

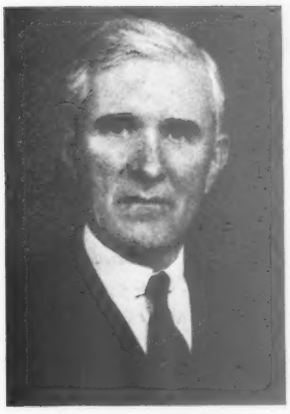
THERE ARE NUMEROUS COLLECTORS of railroad timetables in the country, but Lewis C. Cobb, of the Mitchell & Dillon Coal Company, of Chicago, claims to have the largest collection, both current and historic. Like all true timetable collectors, Cobb scorns having his name put on timetable mailing lists; he wants the thrill of picking them up in various cities he visits. Incidentally, the crown prince of Denmark is one of Europe's most ardent railway timetable collectors.

Signal Section Convenes in Chicago



B. J. Schwendt
N. Y. C. Chairman

Two-day program includes reports on economics of stopping and starting trains, crossing protection, new standards and descriptions of modern apparatus



E. P. Weatherby
T. & P. Chairman-Elect

ANALYSIS of the costs of stopping and starting trains, a study of proper train speeds at automatic interlocking plants, explanations of the new route-control interlocking machines, requisites for automatic highway-railroad grade crossing gates, and studies of track circuit operation were outstanding features of the forty-fourth annual convention of the Signal Section, A. A. R., at the Stevens Hotel, Chicago, on Tuesday and Wednesday, April 5 and 6. B. J. Schwendt, assistant signal engineer, New York Central Lines, in charge of signaling on the Cleveland, Cincinnati, Chicago & St. Louis, presided at the meeting. The attendance was 375 as compared with 442 last year. R. H. C. Balliett, secretary, reported membership in the section to be 1,807, an increase of 46.

Chairman Schwendt opened the meeting with a brief address and then introduced G. M. Crowson, assistant to president, Illinois Central, who discussed Public Relations of the Railroads, explaining in detail the results to be accomplished by public relations work and emphasizing means by which individual officers and employees of the railroads can help in this program. As part of the presentation of the reports of some of the standing committees, other addresses were given. W. F. Zane, signal engineer, Chicago, Burlington & Quincy, presented a paper describing the construction and operation of centralized traffic control on 112 miles of single-track line between Akron, Colo., and Denver. This paper was illustrated by color motion pictures. (An article concerning this installation was published in the *Railway Age* of February 26, 1938, page 366.) W. A. Jackson, superintendent telegraph, New York Central, presented a paper on The Application of Carrier Currents, and Dr. F. C. Parker gave a paper on An Insight to Eyesight, explaining the adaptation of the human eye in relation to railway signaling. C. G. Howard, manager of the Rectifier division of the Fansteel Metallurgical Corporation, explained the construction and operation of a new arrester. H. M. Towne, electrical engineer of the General Electric Company, gave an illustrated lecture explaining the most recent findings in the field of lightning protection.

Chairman Schwendt's Address

In his opening remarks, Chairman Schwendt gave a brief outline of the work accomplished by the standing committees, mentioning especially the study of the costs involved in stopping trains and the extensive tests made of track circuit sensitivity. He emphasized the importance of co-operation between various railroad associations, especially between the Signal Section and the American Railway Engineering Association, the American Association of Railroad Superintendents and the National Railway Appliances Association. He explained that a plan was being advocated under which one appliance show would be held for a sufficient length of time to permit all associations whose members were interested to hold conventions in that city.

After explaining that modern signaling in its various forms can be applied to the solution of many problems of train operation, Mr. Schwendt stated that it is more logical that signal officers should learn more about train operation on their roads than to expect operating officers to learn enough about the details of signals to know how to apply them. Signal officers on various roads are now designated under some 15 different titles, and their sphere of duty is, in numerous cases, too far removed from that of train operation. This condition should be corrected. Each signaling officer, in addition to his usual duties, must be in touch with proposed changes in speed limits, track layouts and operating practices. The sooner signal officers become also operating men, the better, especially in view of the requirement laid down by the recently enacted Signal Inspection Act.

Signal Inspection Law Discussion

S. N. Mills, assistant director of the Bureau of Safety, Interstate Commerce Commission, was called upon to discuss various conditions existing under the new signal inspection law. In introducing Mr. Mills, B. J. Schwendt, chairman, pointed out that co-operation is necessary between the railroads and the Commission if the terms of the law are to be harmoniously inter-

preted by both, and that in the final analysis the definite meaning of disputable points must be determined later.

Mr. Mills briefly reviewed the provisions of the law and administrative measures that have been taken by the Commission thereunder. He said that there are many questions of policy and interpretation of terms which have not yet been determined, and emphasized the fact that any opinions he might express were his own personal opinions and were not to be taken as representative of opinions held by the Commission or by other members of the Commission's staff. Chairman Schwendt invited full and free discussion of questions arising under this law, and a number of questions were propounded from the floor, centering chiefly around applications for approval by the Commission of proposed changes in existing signal installations.

P. M. Gault (M. P.) and P. P. Ash (L. & N.) raised several questions regarding the circular of instructions issued by the Commission on December 1, 1937, covering applications for approval of discontinuance or material modification of signal installations and suggested that it be rewritten, amplified and reissued in such form as to clear up some of the questions raised. Mr. Mills said there was no disposition on the part of the Commission to read anything into the law which was not already written there and that the circular should not be construed as requiring anything beyond the scope of the law.

W. H. Stilwell (L. & N.) and G. H. Dryden (B. & O.) discussed several types of proposed changes and asked whether applications for approval were required to be filed in such cases. Mr. Mills said that under the terms of the law the primary responsibility for determining what constitutes a "material modification" rests upon the carrier; in each case where a proposed change in an existing installation of block signals, interlocking or automatic train control devices is sufficient to be considered a "material modification" an application for approval is required to be filed. He thought that detail changes in circuits, relays or other parts of apparatus which did not reduce the protection afforded by the system as a whole did not require approval by the Commission; however, whenever an application for approval is filed by a carrier covering a proposed change, the Commission assumes that the proposed change, in the judgment of the carrier, constitutes a material modification under the law, and the application is, therefore, acted upon accordingly. In case a carrier does not file an application for approval to make a particular change and some interested party registers a complaint with the Commission, it then becomes the duty of the Commission to make a full investigation and to take such other action as may be required to determine whether the changes made were such as to constitute a material modification.

P. M. Gault (M. P.) asked if it was necessary to apply for authority to install signal protection at a railroad grade crossing where no signal protection was previously provided. Mr. Mills said he interpreted the law to mean that applications must be made only when existing systems or systems hereafter installed are modified and that under that interpretation application for authority was not required in case entirely new facilities were installed where no block signals or interlocking were in use before. E. T. Ambach (B. & O.) asked if information signs such as yard limit boards, etc., and signal devices not forming part of a system such as switch signals, came under the new law. In reply Mr. Mills said that they apparently did not come under the section of the law requiring Commission approval of proposed modifications but that they apparently did come under the general provisions of the law. In response to a question from the floor, Mr. Mills said that with regard to seasonal discontinuance of operation of certain facilities, as where traffic is materially affected by lake or river navigation, it has been the practice of the Commission to issue "continuing" orders, so that once an application has been filed and approved, applications do not have to be made in successive years. Chairman Schwendt (N. Y. C.) stated that, in his opinion, safety was behind the meaning of the term "material modification" and was the primary consideration, as after all that was the stated purpose of the law and the fundamental interest of the Bureau of Safety. W. M. Post (Penna.) said that he would interpret the word "modify" in this particular usage to imply "take away" from existing safety; in other words, that approval is required in case the element of safety in existing installations should be reduced.

W. A. Jackson Discusses Carrier

A non-technical discussion of carrier current systems was presented by W. A. Jackson, superintendent telegraph, New York Central, and chairman of the Telegraph and Telephone Section of the A. A. R. In introducing the subject, Mr. Jackson stated that the principle of application of carrier currents in communication plants "causes many wires to 'grow' where only one or two grew before—and all without the setting of one additional pole—the placing of one additional crossarm—the erection of one additional foot of cable—or without the stringing of one additional mile of wire."

"As applied to the art of communication, there is only one essential difference between radio communication and the application of carrier to wire communication. With radio we use a system of modulated carrier frequencies literally to cast our available energy to the four winds. By the carrier principle we are able to avoid such an apparently wasteful expenditure of energy, and can, by exactly analogous methods, confine our transmission to the vicinity of one or more metallic conductors and guide it to the desired destination."

After giving a description of carrier systems by analogy to an elementary type of telephone circuit for two-way communication, Mr. Jackson discussed the historical development of carrier systems and emphasized the importance of the three-element vacuum tube to carrier and other communication plant facilities. Having set forth the principles applicable to all types of carrier systems, Mr. Jackson concluded his discussion with the following remarks:

"You, as signal engineers, are more interested in the possibilities in the way of the application of carrier principles to your particular field. The temptation to generalize exists here. It can be said, we believe, that in-so-far as transmission over wires is concerned, any impulses which can be transmitted by the existing more conventional methods can, in general, be handled by carrier. The same general engineering principles which apply in the communication field would undoubtedly apply to your field. In other words, the ultimate criterion is usually the annual carrying charge.

"The equipment for the carrier telegraph is not so complicated, or costly, and it is reasonable to assume would be satisfactory for signaling. While the present equipment is perhaps too expensive to be considered for use in railroad signal service, I am quite sure that our progressive and up-to-date signal supply industry is keeping an eye on developments in the carrier, looking towards the possibility of adapting it for use in the signal field."

Economics of Signaling

C. A. Taylor, Chairman*

The Committee on Economics of Railway Signaling submitted a progress report on investigations of the costs involved in stopping trains, presented a comparison of train operation by train orders with operation by centralized traffic control between Poplar Bluff, Mo., and Knobel, Ark., on the Missouri Pacific, which was given on page 938 of the *Railway Age* of June 5, 1937, and reported on recent changes made by various railroads from automatic train control to automatic cab signals.

Costs of Stopping Trains

As explained in the progress report submitted at the 1937 annual meeting, it is not practicable to prepare sufficient data and charts to cover all conditions of train stops and slow downs so that a direct reading of costs may be obtained, but it is practicable to set up formulae by which specific cases may be calculated when desired, if the necessary data pertaining to each case are available.

Some of the conclusions reached by the committee after investigations conducted on this basis are as follows:

It was found that a 400-ton 4-8-4 locomotive, hauling 10,000 tons on the angle of repose, requires 465 seconds, expends 320 h.p. hours of work, and travels 11,100 ft. to accelerate to 30 m.p.h. The 4-8-4 locomotive accelerating 4,000 tons in 45-ton

* Superintendent Telegraph & Signals, Chesapeake & Ohio.

cars, plus 400 tons weight of locomotive, or 4,400 tons, from zero to 30 m.p.h. on level tangent track, requires 245 h.p. hours of work delivered at the axle, or 183 k.w.h. A 2-10-4 locomotive accelerating 4,000 tons in 45-ton cars, plus 450 tons weight of locomotive, or 4,450 tons, from zero to 30 m.p.h. on level tangent track, requires 205 h. p. hours of work delivered at the axle, or 153 k.w.h. The 4-8-4 locomotive is required to deliver 245 h.p. hours of work as against the 2-10-4 locomotive's 205 h.p. hours of work to accelerate approximately the same load, a difference of 40 h.p. hours of work, or 29.8 k.w.h. This saving is due to the differences in the two types of locomotives. The 2-10-4 locomotive has a considerably better driver axle tractive effort than the 4-8-4 locomotive. These figures are predicated on a 4,000-ton load being accelerated in 45-ton cars; if accelerated in 80-ton cars the resistance to traction is considerably reduced, and the 2-10-4 locomotive requires 180 h.p. hours of work delivered at the axle, or 135 k.w.h., or a saving of 65 h.p. hours of work delivered at the axle, or 48.5 k.w.h., as compared with the 4-8-4 locomotive accelerating the same load in 45-ton cars.

If a comparison is made by accelerating a train of say 6,000 tons, the 4-8-4 locomotive requires 620 h.p. hours of work delivered at the axle, or 462 k.w.h., while the 2-10-4 locomotive requires 375 h.p. hours of work delivered at the axle, or 280 k.w.h., a difference of 254 h.p. hours of work, or 182 k.w.h. If this 6,000-ton load is in 80-ton cars, the resistance to traction is considerably reduced, and the 2-10-4 locomotive requires 305 h.p. hours of work delivered at the axle, or 228 k.w.h., whereas the 4-8-4 locomotive accelerating the same load in 45-ton cars requires 315 more h.p. hours of work delivered at the axle, or 234 k.w.h.

Efforts will be made to co-ordinate the figures obtainable from the working charts so that a more direct reading chart may be developed of the h.p. hours or k.w. hours of work required to be delivered at the axle, which is the essential item involved in the "cost of stopping trains." (The material given above is a brief abstract of an extensive report presented by the committee.)

Signaling Practice

C. H. Tillett, Chairman*

The report of the Committee on Signaling Practice included an explanation of the construction and operation of the new button-type, route-control interlocking machine.

To develop a report on increased speeds through automatic interlocking plants, the committee circularized Signal Section representative members to determine what speeds are now used over railroad crossings at automatic interlocking plants and to obtain their opinion as to the maximum speeds which might be considered proper.

Because automatic releases and time-delay features are involved, questions with regard to such apparatus were included in the circular. Of the replies received from 104 railroads, 49 reported a total of 352 automatic interlocking plants and 55 railroads reported none. Present speed restrictions were reported as varying from 15 to 60 m.p.h. with operative distant signals, and from 5 to 30 m.p.h. without distant signals, one road reporting that all trains stopped. The maximum speed considered proper over crossings at automatic interlocking plants with operative distant signals, so far as signaling is concerned, varied from 5 m.p.h. to "unlimited" as conditions require, while speeds suggested with inoperative distant signals varied from restricted speed to 40 m.p.h. Automatic approach releases were reported in use on 20 railroads. The time-delay periods reported between changes of line-up with approach circuits occupied, varied from 10 sec., to protect against loss of shunt, to 7 min.

The committee also presented reports on the preferred height of light signals; the use of low light signals for movements against the current of traffic in multiple-track territory where the track is signaled for both directions; the use of low light signals in connection with automatic block signaling and interlocking, including automatic interlocking; the use of automatic recorders; requirements of the Interstate Commerce Commission with regard to automatic train-stop or train-control devices; installations of automatic train control and automatic cab signals, with equipped locomotives as of July 1, 1937; and the removal of Part 163, Automatic Train Control, and the accompanying clearance diagram, from the Manual.

* Signal Engineer, Canadian National.

Report on Highway Crossing Protection

P. M. Gault, Chairman*

The following requisites for automatic gates at highway crossings at grade over railway tracks were the basis of a report by the Committee on Highway Grade Crossing Protection:

1. Automatic gates shall be provided preferably as an adjunct to A. A. R. recommended automatic crossing signals of the flashing-light or wig-wag type.

2. Automatic gates for the protection of highway traffic at a railroad grade crossing shall, when indicating the approach of a train, present toward the highway the appearance of a horizontal arm or arms extending over the traveled roadway a sufficient distance to cover the lane or lanes used by traffic approaching the crossing.

3. The automatic gate arms, when not indicating the approach of a train, shall not obstruct or interfere with highway traffic.

4. A highway crossing bell, if used, shall sound a warning while the gate is being lowered.

5. The automatic gate arms shall be mounted on posts or housings containing the arm operating mechanisms.

6. The design of the gate-operating mechanisms shall, so far as practicable, be such as to insure proper operation during unfavorable weather conditions, and, if out of order, the gate arm shall assume the horizontal position across the roadway.

7. The mechanisms shall be so designed that if the arms, while being raised or lowered, strike or foul an object, they will readily stop, and on removal of the obstruction shall assume the position corresponding with the control apparatus. The arms shall be so arranged that, if a vehicle is entrapped between the lowered gates, it may proceed off the crossing.

8. Circuits for operation of the automatic gates shall be so arranged that gates will start to assume the horizontal position between 3 and 5 sec. after the warning signals start to operate. Gates shall reach full horizontal position before the arrival of the fastest train operated over the crossing and shall remain down until the rear of the train has cleared the crossing.

9. Each gate arm extending over the roadway shall have two red lights for each lane of traffic it protects, shining in both directions along the highway for night indication. The red lights on the gate arms shall, when lighted, burn steadily except where gates are used without A. A. R. flashing-light or wig-wag signals, in which cases the two lights in each lane shall flash alternately.

10. The bottom of gate arms, when in the horizontal position, shall be not less than 3, nor more than 4 ft. above the crown of the roadway.

11. The gate arms shall be painted on both sides with alternate diagonal stripes of white and black.

12. The automatic highway crossing signals shall operate in accordance with A. A. R. recommended practice and independently of the gates.

13. Details of the signals, gates, operating mechanism and control circuits shall be in accordance with A. A. R. recommended practice.

14. The gate arms shall operate uniformly, smoothly and complete all movements without rebound or slap and be securely held when in the raised position.

15. Each individual gate post shall be provided with independent operating mechanism, and housing shall be of sufficient size to allow ready inspection, adjustment and repairs.

16. The lights on the gate arms shall burn except when arms are in the raised position.

*Signal Engineer, Missouri Pacific.

17. The highway traffic lanes in the vicinity of the crossing shall be distinctly marked.

Discussion

When discussing the proposed requisites, several objections were raised concerning the control of the lamps on the gates as required in item 9, a contention being made that two of the lamps should flash on all gates regardless of whether a signal is used. Others contended that the lamps should burn steadily in all instances. One member contended that the requisites should be confined to short-arm gates for the approaching lane of traffic only. On one road using gates across the entire width of the roadway, the mechanisms are so designed that the arm will swing outward to permit drivers trapped on the crossing to push the gate arm around to permit escape. This road has a sign on the track side of the arm reading "Push, This Gate Will Swing." In view of the numerous criticisms, the committee withdrew the recommendation that the requisites in the present form be considered for inclusion in the manual.

Other Committee Reports

The report of the Committee on Interlocking contained certain revised specifications covering electro-pneumatic switch-operating mechanisms, circuit controllers for drawbridges, and electro-mechanical interlocking machines. A revised form of the requisites for mechanically locking the levers of interlocking machines was prepared. The committee also submitted a specification for interlocking at drawbridges for the protection of train movements, and requested that the assignment covering methods of protecting railroads crossing at grade, where traffic conditions do not justify an interlocking plant, be withdrawn.

The Committee on Contracts and Instructions reported on the partial revision of definitions for technical terms used in signaling; the revision of instructions for the installation and handling of caustic soda batteries; instructions for fire protection at interlocking stations and other buildings housing signal equipment; and revisions in the table of signal and interlocking units.

The Committee on Designs presented 11 revised drawings for signal equipment, suggested that 1 drawing be removed from the Manual, and presented 1 new drawing. The committee also presented revised forms of Specification 69-35 covering signal glasses, exclusive of hand lantern globes, Specification 5927 covering kerosene hand lantern globes, and of the specification for wrought-iron bars; two new specifications were submitted, one for bolts, nuts and threads, and the other for electric lamp cases. In addition, a progress report was given on the simplification of sizes and kinds of electric lamps for signal purposes, and a co-operative report with the American Standards Association was presented covering letter symbols and abbreviations.

The Committee on Materials Research recommended that Specification 8820 on lead-type portable storage batteries, Specification 11728 on battery jars, and Specification 43-34 for electrolyte be removed from the Manual, and that Federal Specification O-A-111 be used in place of Specification 43-34. The committee submitted a new specification for paint and painting of braid-covered aerial wires and cables, a progress report on Specification 172-37 on air-depolarized caustic soda cells, and a co-operative report with the American Standards Association on electric insulating materials in general.

The Committee on Overhead and Underground Lines presented a new specification for weather-resisting braid coverings for aerial rubber-insulated wire and cable, and submitted progress reports on modifications of the N. E. S. Code to avoid conflict with recognized signal practice, on stringing sags for weatherproof line wire, and on the possible substitution of asbestos, varnished cambric or other types of non-inflammable materials as insulation for wire for use in signal stations.

An extensive report was presented by the Committee on Automatic Block Signaling, including new specifications and drawings covering welded-type rail-head bonds and track circuit connectors; mechanically-applied rail-head-type bonds and track circuit connectors; a new specification for centralized traffic control type neutral direct-current relays; revised specifications and drawings covering single and duplex conductor plug-type rail bonds and connectors, and track circuit bonding; revised and consolidated requisites for minimizing the sweating of signal apparatus; a progress report on protection against lightning; and information on various subjects such as protection against burnouts by lightning for lamps of highway grade crossing flashing-light signals, rectified a-c. track circuits, corrective measures for phantom indication of light signals (other than highway crossing flashing-light signals), inductive co-ordination measures, and the necessary modification of direct-current track circuits in detail or in principle to insure reliable protection of rail motor cars of the passenger or freight carrying type.

Signal Appliance Association

At the Signal Appliance Association's annual meeting on April 6, the following new officers were elected: Chairman, F. C. Koch, Simmons-Boardman Publishing Corporation, New York; vice-chairman, H. S. C. Folk, Electric Storage Battery Company, New York; secretary-treasurer, G. A. Nelson, Waterbury Battery Company, New York. New members of the Committee of Direction included the officers listed above and also: B. A. Lundy, Railroad Accessories Corporation, New York; G. Swallow, Continental Diamond Fibre Company, Bridgeport, Pa.; R. H. Weber, Thomas A. Edison, Inc., Bloomfield, N. J.; C. Gilman, Massey Concrete Products Company, New York; and H. H. Febrey, American Steel & Wire Company, New York (honorary).

New Books

*Magnitude and Frequency of Floods on Illinois Streams. By George W. Pickels, professor of civil engineering, University of Illinois. 62 pages, 6 in. by 9 in. Bound in paper. Bulletin No. 296, Engineering Experiment Station, University of Illinois, Urbana, Ill. Price 70 cents.**

This monograph is the result of a study of discharge records of 24 rivers, that have been kept for periods ranging from 8 to 31 years, for the purpose of developing the probable frequency and magnitude of future floods. Through a mathematical procedure these data have been used to develop tables of the probable flood discharges for frequencies ranging from 5 to 100 years. The author also offers suggestions for the practical application and interpretation of these tables in determining the requirements of engineering works.

Wood Preservation, by George M. Hunt, in charge, section of wood preservation, United States Forest Products Laboratory, and George A. Garratt, associate professor of forest products, Yale School of Foresty. 457 pages, 6 in. by 9 in. Bound in cloth. Published by McGraw-Hill Book Company, Inc., 1330 West 42nd street, New York. Price $5.

Commencing with a brief for wood as a material of construction and ending with statistical data on the production of treated wood, this book comprises a decidedly readable and thoroughly up-to-date survey of the entire field encompassed by the title. It will have its greatest usefulness in the hands of the user of treated wood who wishes to acquaint himself with the basic principles of wood preservation as well as with the practical considerations that enter into the preparation of wood for treatment, its impregnation, and the care and use of the finished product. For the reader who uses it as the foundation for a more extended study of the subject, bibliographies at the end of each chapter will prove very helpful.

A measure of the scope of the treatment is indicated by the attention given to toxicity of preservatives and factors affecting penetration, on the one hand, and such practical matters as anti-checking devices and plant equipment on the other. While the chapter on preservatives relates largely to creosote, zinc chloride and creosote-petroleum mixtures, some space is given to all of the more common chemicals used, including a frank discussion of proprietary preservatives.

* A limited number of copies are available for free distribution.

NEWS

Wheeler Hearings Brought to Close

Pelley, Fletcher and Hays are witnesses at final session of Senate committee

What is supposed to have been the last public session of the Wheeler rail finance committee was held on April 1. The witnesses were J. J. Pelley, president of the Association of American Railroads, Judge R. V. Fletcher, vice-president and general counsel for the A. A. R. and Joseph H. Hays, counsel for the Western Association of Railway Executives. Mr. Hays did most of the testifying, continuing to relate his activities with the Western Association in working for enforcement of bus and truck regulations in the several mid-western states.

Another subject that came up for discussion was the formation of the Transportation Association of America. Mr. Pelley admitted that the A. A. R. had contributed $5,000 to the T. A. A. to get the organization under way. He also told the committee that at present about 28 per cent of the T. A. A.'s funds come from the various railroads and that four out of the 48 directors are railroad men.

The committee investigators introduced into the record a letter from Fred W. Sargent, president of the Chicago & North Western, to Mr. Pelley, in which he questioned the necessity of the T. A. A. His letter follows:

Dear John:

I have yours concerning the Transportation Association of America, and have examined the correspondence as well as the brochure published and signed by Mr. Harkrader, President.

Frankly, I cannot see but what the purposes and functions of the Transportation Association of America are direct duplications of most of the branches of work now covered by the Association of American Railroads. We are getting so many new organizations, and the assessments and fees are so numerous, that the burden is now becoming a material one.

May I ask what, in your conception, will the Transportation Association of America do that ought not be covered by the organization and work of the Association of American Railroads?

Mr. Pelley replied to Mr. Sargent, telling him that he felt that the T. A. A. was not to be a railroad organization, but that it was set up to promote all forms of transportation and that there was a distinct need for it. Mr. Pelley also pointed out to Mr. Sargent that the organization would look out for the interests of the railroads and try to protect them from unfair water transportation.

The hearing was adjourned to meet again at the call of the chairman. Senator Truman said that he believed this would be the last hearing, but that the committee might meet again to clear up certain parts of the record and insert various exhibits.

At the conclusion of the hearing on April 1, Judge Fletcher asked permission to file with the committee a statement in writing with respect to the organization and activities of the A. A. R. On April 6 President Pelley filed a nine-page statement setting forth the history and purposes of the organization in considerable

(*Continued on page 678*)

January Deficit Was $33,475,907

Compares with a net loss of $4,502,006 for first 1937 month

Class I railroads reported a deficit, after fixed charges and other deductions, of $33,475,907 in January, 1938, as compared with

SELECTED INCOME AND BALANCE-SHEET ITEMS OF CLASS I STEAM RAILWAYS IN THE UNITED STATES

Compiled from 136 Reports (Form IBS) Representing 141 Steam Railways
TOTALS FOR THE UNITED STATES (ALL REGIONS)

Income Items	For the month of January 1938	1937
1. Net railway operating income	$6,932,862	$38,849,944
2. Other income	12,733,141	12,066,447
3. Total income	19,666,003	50,916,391
4. Miscellaneous deductions from income	2,256,678	1,820,699
5. Income available for fixed charges	17,409,325	49,095,692
6. Fixed charges:		
6-01. Rent for leased roads	10,274,932	12,520,031
6-02. Interest deductions	39,372,661	39,846,456
6-03. Other deductions	225,067	223,471
6-04. Total fixed charges	49,872,660	52,589,958
7. Income after fixed charges	*32,463,335	* 3,494,266
8. Contingent charges	1,012,572	1,007,740
9. Net income	*33,475,907	* 4,502,006
10. Depreciation (Way and structures and Equipment)	16,692,013	16,184,300
11. Federal income taxes	1,506,343	2,366,307
12. Dividend appropriations:		
12-01. On common stock	3,659,759	3,476,226
12-02. On preferred stock	685,707	685,707

Selected Asset Items	Balance at end of January 1938	1937
13. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	$661,289,191	$682,444,443
14. Cash	$336,622,210	$513,992,635
15. Demand loans and deposits	15,218,812	6,670,342
16. Time drafts and deposits	29,266,014	44,608,638
17. Special deposits	63,731,853	154,763,038
18. Loans and bills receivable	1,831,398	2,556,934
19. Traffic and car-service balances receivable	51,978,424	62,484,112
20. Net balance receivable from agents and conductors	42,207,289	50,158,590
21. Miscellaneous accounts receivable	138,857,000	144,207,889
22. Materials and supplies	383,387,508	321,220,955
23. Interest and dividends receivable	20,380,114	23,228,458
24. Rents receivable	1,039,215	1,463,986
25. Other current assets	4,255,803	6,279,672
26. Total current assets (items 14 to 25)	$1,088,775,640	$1,331,635,249

Selected Liability Items	Balance at end of January 1938	1937
27. Funded debt maturing within 6 months†	$93,913,185	$160,860,210
28. Loans and bills payable‡	$223,182,643	$214,204,413
29. Traffic and car-service balances payable	69,281,557	81,342,452
30. Audited accounts and wages payable	249,291,903	242,034,366
31. Miscellaneous accounts payable	60,769,606	116,037,771
32. Interest matured unpaid	662,677,227	533,347,946
33. Dividends matured unpaid	5,739,442	7,256,797
34. Funded debt matured unpaid	506,937,059	480,511,352
35. Unmatured dividends declared	4,393,315	4,393,315
36. Unmatured interest accrued	96,495,960	103,177,442
37. Unmatured rents accrued	25,918,598	24,986,950
38. Other current liabilities	18,819,355	26,847,624
39. Total current liabilities (items 28 to 38)	$1,923,506,665	$1,834,140,428
40. Tax liability (Account 771):		
40-01. U. S. Government taxes	$57,954,425	$112,785,129
40-02. Other than U. S. Government taxes	138,731,754	134,195,744

† Includes payments which will become due on account of principal of long-term debt (other than that in Account 764, Funded debt matured unpaid), within six months after close of month of report.
‡ Includes obligations which mature not more than 2 years after date of issue.
* Deficit or other reverse items.

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE $25,000,000

Name of railway	Net income after deprec. For the month of January 1938	Net income after deprec. For the month of January 1937	Net income before deprec. For the month of January 1938	Net income before deprec. For the month of January 1937
Alton R. R.	* $165,297	$8,293	* $134,653	$37,579
Atchison, Topeka & Santa Fe Ry. System¶	* 1,778,124	270,895	* 796,770	1,206,578
Atlantic Coast Line R. R.	1,036,222	1,443,285	1,203,484	1,614,653
Baltimore & Ohio R. R.	* 2,118,536	* 334,090	* 1,508,943	266,302
Boston & Maine R. R.	* 534,394	71,229	* 399,256	204,261
Central of Georgia Ry.†	* 333,189	* 223,883	* 260,836	* 158,668
Central R. R. of New Jersey	* 220,694	* 274,136	* 102,457	* 148,525
Chesapeake & Ohio Ry.	1,342,053	1,568,356	2,034,735	2,254,620
Chicago & Eastern Illinois Ry.‡	* 149,902	* 22,856	* 98,133	24,508
Chicago & North Western Ry.‡	* 2,056,416	* 1,627,728	* 1,630,940	* 1,213,879
Chicago, Burlington & Quincy R. R.	* 681,093	* 174,064	* 262,535	226,336
Chicago Great Western R. R.‡	* 246,205	* 152,668	* 201,232	* 108,979
Chicago, Milwaukee, St. Paul & Pacific R. R.‡	* 1,844,952	* 1,333,553	* 1,374,481	* 885,377
Chicago, Rock Island & Pacific Ry.‡	* 1,299,957	* 1,314,165	* 953,725	* 973,192
Chicago, St. Paul, Minneapolis & Omaha Ry.	* 292,600	* 396,441	* 243,480	* 347,057
Delaware & Hudson R. R.	* 282,793	* 52,434	* 195,289	36,736
Delaware, Lackawanna & Western R. R.	* 383,747	* 38,230	* 176,854	172,662
Denver & Rio Grande Western R. R.‡	* 523,536	* 382,686	* 423,411	* 286,743
Elgin, Joliet & Eastern Ry.	* 48,974	117,505	34,847	191,241
Erie R. R.§ (including Chicago & Erie R. R.)	* 949,280	1,064	* 633,646	319,148
Grand Trunk Western R. R.	* 504,797	* 245,431	* 410,207	* 158,575
Great Northern Ry.	* 1,712,209	* 1,104,041	* 1,401,937	* 802,378
Illinois Central R. R.	* 37,028	* 931,529	500,629	* 399,780
Lehigh Valley R. R.	* 188,494	* 210,141	* 3,183	* 19,366
Long Island R. R.	* 230,273	* 346,227	* 132,549	* 248,511
Louisville & Nashville R. R.	* 166,415	166,884	191,119	514,869
Minneapolis, St. Paul & Sault Ste. Marie Ry.‡	* 726,352	* 736,227	* 624,912	* 632,895
Missouri-Kansas-Texas Lines	* 308,626	* 137,299	* 200,118	* 38,925
Missouri Pacific R. R.‡	* 1,392,690	* 968,129	* 1,024,790	* 603,963
New York Central R. R.ø	* 2,895,463	787,741	* 1,557,188	2,118,290
New York, Chicago & St. Louis R. R.	* 370,563	204,478	* 227,684	338,876
New York, New Haven & Hartford R. R.‡	* 1,173,409	* 205,603	* 892,482	79,732
Norfolk & Western Ry.	740,855	2,141,718	1,155,826	2,528,294
Northern Pacific Ry.	* 1,423,364	* 719,604	* 1,141,146	* 451,122
Pennsylvania R. R.	* 1,732,463	1,402,822	299,792	3,417,230
Pere Marquette Ry.	* 405,726	* 149,925	* 186,941	63,098
Pittsburgh & Lake Erie R. R.	* 59,565	291,928	134,426	434,578
Reading Co.	54,429	455,947	311,372	715,996
St. Louis-San Francisco Ry.‡	* 1,338,729	* 777,100	* 1,078,473	* 514,927
St. Louis Southwestern Lines‡	* 228,828	* 121,728	* 176,875	* 70,998
Seaboard Air Line Ry.†	* 652,595	* 189,688	* 484,274	* 32,042
Southern Ry.	* 994,469	68,755	* 738,380	335,936
Southern Pacific Transportation System‖	* 2,606,514	690,330	* 1,912,917	1,348,345
Texas & Pacific Ry.	* 41,962	92,542	56,877	190,049
Union Pacific R. R. (including leased lines)	213,627	175,721	831,845	727,337
Wabash Ry.†	* 851,922	* 91,809	* 672,619	85,052
Yazoo & Mississippi Valley R. R.	* 1,908	* 8,280	39,781	31,886

† Report of receiver or receivers.
‡ Report of trustee or trustees.
§ Under trusteeship Erie R. R. only.
¶ Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.
ø Includes Boston & Albany, lessor to New York Central R. R.
‖ Includes Southern Pacific Company, Texas & New Orleans R. R., and leased lines. The report contains the following information: "Income reported hereon excludes offsetting debits and credits for rent for leased roads and equipment and bond interest, between companies included herein. Interest on bonds of, and rental income from, separately operated solely controlled affiliated companies, whether earned or not, are included in this statement, in order that such income credits will offset income debits reflected in the net deficit of such companies. Operations of all separately operated solely controlled affiliated companies, resulted in a net deficit of $589,937 for January, 1938, and $245,266 for January, 1937, which is not reflected in this statement.
* Deficit.

a January, 1937, deficit of $4,502,006, according to the Interstate Commerce Commission's monthly compilation of selected income and balance sheet items.

Ninety-eight roads reported deficits for January, 1938, and 35 reported net incomes; in January, 1937, 74 reported deficits and 59 reported net incomes. The consolidated statement and a statement showing the net income of roads having annual operating revenues above $25,000,000 are given in the accompanying tables.

Rail Unemployment Insurance Bills Introduced

Senators Wheeler and Wagner have introduced in the Senate S. 3372, and Representative Crosser of Ohio has introduced in the House H. R. 10127, similar bills having to do with the creation of a system of unemployment insurance for railroad employees. The essential features of the bills were outlined in last week's *Railway Age*.

As noted in last week's issue, the rail managements decided that they could not endorse the bill. President Pelley of the Association of American Railroads, said that railroad lawyers were in disagreement as to whether the railroads could be assured that they would not be taxed doubly for unemployment insurance. The question, according to Mr. Pelley, was whether a national law would "preempt the field" and make it certain that individual states would not adopt a similar law thereby necessitating rail payments for two separate plans.

I. C. C. Upheld by U. S. Supreme Court

The United States Supreme Court on April 4 decided that a decision by the Interstate Commerce Commission that the Chicago South Shore & South Bend is a "carrier" within the meaning of the Railway Labor Act, and not an "interurban electric railway" within the meaning of an exemption clause, was not subject to review by a three-judge Federal District Court under the Urgent Deficiencies Act of October 22, 1913.

The Court held that the commission's determination was not an "order" within the meaning of the provision of the Urgent Deficiencies Act giving a court jurisdiction to review an "order" of the commission. According to the Court, the decision of the commission was not in the form of an order and did not command anything to be done, but was merely a finding of fact. The question arose when the National Mediation Board asked the commission to determine whether or not this carrier was an interstate carrier and therefore subject to the Railway Labor Act. The commission held that it was and the trustees of the road appealed.

Status of RFC Rail Loans

The monthly statement of the Reconstruction Finance Corporation as of February 28, shows disbursements to railroads of $544,126,239 and repayments of $182,174,987.

Erie Makes Safety Awards

Special gold star certificates have been awarded by the Erie to 261 supervisors and foremen in the transportation, maintenance of way, locomotive, car and stores departments, for having worked their forces nine years with a perfect safety record.

New "Century" on June 15

New streamlined equipment for the Twentieth Century Limited of the New York Central will be placed in service on June 15, the thirty-sixth anniversary of the inauguration of the train between Chicago and New York.

New Member for House Interstate Commerce Committee

Representative Edward L. O'Neill, Democrat, of Newark, N. J., has been elected a member of the House committee on interstate and foreign commerce to fill the vacancy caused by the death of Representative Kenney.

Highway Aid Bill Introduced

Representative Cartwright of Oklahoma has introduced in the House H. R. 10140, a bill to appropriate $125,000,000 for each of the fiscal years ending June 30, 1940 and June 30, 1941 for federal aid to highways. The bill earmarks $50,000,000 a year for each of the two fiscal years to further the work of grade crossing elimination.

Baldwin Begins Delivery of New A. C. L. Locomotives

The first of a total order of 12 new 4-8-4 type steam locomotives being built by Baldwin for the Atlantic Coast Line for service on the Richmond (Va.)-Jacksonville (Fla.) run, has been delivered. Upon receipt the locomotives are being taken to the Waycross (Ga.) shops of the road for a thorough inspection and are assigned to freight runs for a week or so, to be "broken in."

"Frisco First" a New Publication

"Frisco First," a new eight-page news organ is being published by the St. Louis-San Francisco for the purpose of emphasizing matters of interest to its traffic departments, the first issue being that of April. The publication, written in newspaper style, will also carry news of men's and women's employee clubs, personnel items and news matter of general railroad

interest, together with pictures and illustrations. Messages of traffic officers will be carried under by-lines.

Canadian Roads Offer Easter Fare Specialties

The Canadian Passenger Association has announced special fare reductions to apply on the Canadian roads during the Easter season. Round trip fares consisting of single fare and one-quarter, good in both coaches and sleeping cars, will be offered for the period commencing April 14, with return movement allowed up to midnight on April 19. Special fares will also be made available to teachers and pupils during the school vacation period, allowing a more extended return period.

Oral Argument on North-South Divisions

The Interstate Commerce Commission this week heard oral arguments in No. 24160, the investigation launched by the commission on its own motion in 1931 into divisions of joint class and commodity rates between Official and Southern territory roads. Examiner Hosmer's proposed report, recommending revised bases—which would not greatly alter the present apportionment of revenues as between the contending carrier groups, was reviewed in the *Railway Age* of July 24, 1937.

R. C. C. Distribution

The Railroad Credit Corporation, on April 15, will make a liquidating distribution of one-half of one per cent, amounting to $367,558, according to President E. G. Buckland. Of this amount $302,205 will be paid in cash and $65,353 will be credited on carriers' indebtedness to the Corporation.

This will bring the total amount distributed to $56,971,440, or 77½ per cent of the fund originally contributed by the carriers participating in the Marshalling and Distributing Plan, 1931. Of this total $29,654,195 will have been returned in cash and $27,317,245 in credits.

House and Senate Pass RFC Amendment

The House has passed and sent to conference S. 3735, a bill introduced by Senator Glass of Virginia which would authorize the board of directors of the Reconstruction Finance Corporation to liberalize their loan requirements. The Senate passed the bill April 1, but included an amendment which would require the approval of the Interstate Commerce Commission for all railroad loans. The House deleted this provision, with the result that the bill was sent to conference. Presumably, if the R. F. C. decides to liberalize the requirements for loans, railroads will be eligible for such loans.

N. R. A. A. Refund

The National Railway Appliances Association is distributing among its members a refund of 20 per cent of the money collected for space at the exhibit held at the International Amphitheatre, Chicago, on March 14-17, during the convention of the American Railway Engineering Association. This is the second consecutive year in which this association has made a refund of this amount.

Records of the association show that more than 12,000 persons attended this exhibit, or 20 per cent more than attended the exhibit in 1937. This large attendance was especially pleasing to the exhibitors because of the fact that the exhibit was held this year in the International Amphitheatre, somewhat further removed from the convention headquarters than in previous years.

Two Santa Fe Streamliners in Service April 17

The "Kansas Cityan" and the "Chicagoan," two new streamlined trains, will be placed in service between Chicago and Wichita, Kan., by the Atchison, Topeka & Santa Fe on April 17. The schedule calls for a running time of 7½ hr. between Chicago and Kansas City, Mo., and 4 hr. between Kansas City and Wichita. Fifteen-minute stops are scheduled for both trains in Kansas City. Scheduled stops will be made by both trains at Streator, Ill., and Galesburg; Fort Madison, Iowa, Kansas City, Mo.; and Lawrence, Kan., Topeka, Emporia and Newton. The westbound train will leave Chicago each morning at 9:30 and will arrive in Kansas City at 5 p. m. and Wichita at 9:15 p. m. The eastbound train will leave Wichita at 9:48 a. m. and Kansas City at 2 p. m. and will arrive in Chicago at 9:30 p. m. The trains, drawn by 1,600-hp. Diesel-electric locomotives, will include a baggage car, three chair cars, a club-chair car, a dining car and a parlor-observation car. No extra fare will be charged and coach fare tickets will be honored except in the parlor-observation car, where first class tickets are required.

A. F. of L. Department Meets at Chicago

A program for rehiring unemployed railroad workers and stabilizing employment throughout the industry was approved and a resolution assuring the organization's support of William Green, president of the A. F. of L., in its fight against the C. I. O. was passed by delegates to the convention of the Railway Employees' department of the American Federation of Labor at Chicago on April 4-8. The delegates, representing the seven railroad craft unions, comprising the Railway Employees' department, recommended that the railroads be asked to assure one year of steady work to the necessary employees in every class, contending the plan will increase purchasing power by releasing more than 1,250,000 workers from fear of unemployment.

Mr. Green, in an address to the convention, contended that the only way that the railways can be saved, the workers pro-

R. R. Supporters Urge Wider Use of Railway Age

With the advertising manager of the Association of American Railroads, the advertising agency executive handling A. A. R. advertising, public relations and passenger officers from the Pennsylvania, Baltimore & Ohio, Northern Pacific and a publicity representative of Western roads present, the Committee on Railroad Support, in New York, devoted its April meeting last week to a thorough discussion of methods of "Selling the Railroads to the Public." The *Railway Age* receives altogether too minor a distribution by railroads themselves, was the first point of commentary by members of the Committee, who alleged that it not only is omitted from the many magazines in lounge cars but that more railway officers and employees as well should peruse it. It was stated that the magazine goes to only one off-line passenger office of the many in New York City; that train-service employees who receive copies of it through members of the Committee on Railroad Support appear elated to receive it. The Committee recommended immediate correction of the railroads' negligence in not putting the constructive editorial contents of the *Railway Age* before many rail employees, when large sums are being devoted to far more visionary projects of a literary nature.

A wider dissemination of brief and informative data among employees was urged. A member produced 250 signatures which he had secured favoring the Pettengill bill, only 3 per cent of which were from rail employees. Many employees refused to sign it, asserting that to do so "would make the companies too powerful," despite the fact that even the unions have favored this bill, thus indicating that the railways had not brought this fact to their employees' attention.

A discussion of the railroads' institutional advertising campaign evoked comments that it lacked "punch." Railway officers responded that this was intentional; that a moderate tone was regarded as preferable.

Discussions of the efficacy of "Railroad Data" and of other publications followed the signing of letters to Senator Copeland (N. Y.) urging him to change from his opposition to the Pettengill bill, and to Governor Lehman (N. Y.) urging him to sign the bill to regulate intercity trucks. Rail representatives pointed to the hazards of consolidation of railroads, depriving intermediate towns of through service, even where duplication may exist between terminal points.

The meeting closed with further discussion of the lassitude of railway employees toward matters vitally affecting their own welfare and on which they evince no interest because they are hostile to the interests of their companies, according to first-hand reports from employees of New York railways who are, themselves, members of the Committee on Railroad Support.

tected and the public service maintained is through government ownership. "I can see no other remedy," he said, "for the problem created by railroad management. Debts have been mounting since the railroads were built. Debts have been refunded until the situation is impossible of private solution."

Other subjects considered were the elimination of grade crossings through a billion-dollar federal bond issue, consolidation and a six-hour day.

Correction—A. A. R. Advertising Expenses

The article entitled "Wheeler Committee Bares A. A. R. Legislative Activities," which appeared in the *Railway Age* of April 2, page 612, was in error in reporting that Judge R. V. Fletcher, vice-president and general counsel of the Association of American Railroads, had testified that A. A. R. advertising expenses have averaged 79/1,000 of one per cent of gross railroad revenues, or 79.2 cents per $1,000 of gross. Actually that was the 1937 relation of total A. A. R. costs to gross, including the figure for advertising and all public relations activities which last year was 23/1,000 of one per cent of gross revenues, or 22.7 cents per $1,000 of gross.

Tacoma Overlap Claim Denied N. P.

The Northern Pacific's claim for indemnity for 213,000 acres of timberland in the "Tacoma overlap" phase of the land grant case being heard at Spokane, Wash., was denied by the United States district court at that point on March 28. The railway sought the indemnity from the government, claiming the land under Congressional acts of 1864 and 1870, which granted the expanding line many acres of land along its Western right-of-way. The "Tacoma overlap" contest developed where the line turned from an east-west route to a north-south course. The railway was granted land along each side of the line and sought to file on land elsewhere to substitute for the overlap at the junction of the two routes.

New York Railroad Club to Hold Dinner on April 21

The New York Railroad Club will hold its spring dinner and meeting on Thursday, April 21, in the Hotel Commodore, New York, at 7 p. m., as announced in a special program prepared in the "gay 'Nineties" motif. There has been arranged, to follow the dinner, a program which will consist of a series of three-minute anecdotal talks by men prominent in railroading, including W. G. Bessler, chairman, Central of New Jersey; J. M. Davis, president, Delaware, Lackawanna & Western; C. E. Smith, vice-president, New York, New Haven & Hartford; C. W. Galloway, vice-president, Baltimore & Ohio; Samuel Vauclain, chairman, Baldwin Locomotive Works; W. C. Dickerman, president, American Locomotive Company; George LeBoutillier, vice-president, Pennsylvania; H. H. Vreeland, chairman, executive committee of the club, and John Draney, retired engineer, Delaware, Lackawanna & Western. Following these short talks a stage show will be presented entitled "Those Happy Days." It should be noted that because the regular meeting date falls upon Good Friday, April 21 has been set as the date of the dinner. Reservations should be made through David W. Pye, Room 830, 30 Church Street.

Two-Day "Fan" Trip for New England

A two-day railroad fan trip will be operated by the Boston & Albany and the Rutland between Boston, Mass., and Bennington, Vt., on April 18 and 19. The party will leave South station, Boston, at 6:35 p. m., April 18, on train 49 of the B. & A. and will "lay over" at Pittsfield, Mass, for the night. Leaving Pittsfield at 6:55 a. m., on April 19, they will journey to Bennington, Vt., and return through Lebanon valley, being hauled as part of a regular Rutland mixed train. They will arrive in Boston at 11:05 p. m. on Train 16 of the B. & A. The total cost of the trip, including hotel at Pittsfield and meals in the dining car, is quoted at $7.50. The Railroad Enthusiasts, Inc., New England division, are the sponsors.

Arch-Bar Cars Will Earn Rentals Until July 1 Deadline

The Association of American Railroads on March 31 issued a ruling whereby freight cars equipped with arch-bar trucks will continue to earn regular per diem and mileage payments until July 1, the effective date of the order prohibiting the use of such cars in interchange service. When the A. A. R. last November extended the deadline from January 1 to July 1 it also provided that "after April 1, 1938, mileage or per diem shall not be paid car owners for cars equipped with arch-bar trucks."

The March 31 ruling lifts the latter proviso; the July 1 deadline remains unchanged. Meanwhile the supplement to the mileage tariff which proposed to cut off payments on April 1 has been withdrawn.

Data on the arch-bar truck situation were given in the latest annual report of Director W. J. Patterson of the Interstate Commerce Commission's Bureau of Safety, which was reviewed in the *Railway Age* of January 29. There it was estimated that had the order become effective on January 1, the number of cars temporarily prohibited in interchange in the United States would have been "less than 150,000.'"

Ex Parte 123

As indicated in its supplemental Ex Parte 123 report (see *Railway Age* of April 2, page 632) the Interstate Commerce Commission has set up a committee of its employees "with whom matters may be taken up informally concerning adjustments which are believed to be necessary to carry out the purposes of the determinations made by the commission in that decision." Examiner Hosmer is chairman of the committee, which "will have the advice of the Director of the Bureau of Traffic and will consult with Division 7 of the commission when necessary."

Meanwhile the Bureau of Traffic is sponsoring a meeting of tariff publishing agents with a view to working out a uniform plan of dealing with the publication of the regular tariffs incorporating the 123 increases which will supplant the master tariff.

Freight Car Loading

Loading of revenue freight for the week ended March 26 totaled 572,952 cars, an increase of 32,620 cars or six per cent above the preceding week, but a decrease of 183,464 cars or 24.3 per cent below the corresponding week in 1937 and a decrease of 302,433 cars or 34.5 per cent below the same week in 1930. All commodity classifications except grain and forest products showed decreases under the preceding week, while all commodity classifications except grain showed decreases under last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, March 26			
Districts	1938	1937	1936
Eastern	122,482	171,566	135,163
Allegheny	105,411	162,032	112,929
Pocahontas	33,652	59,539	40,444
Southern	94,941	120,668	93,166
Northwestern ..	70,216	78,460	71,905
Central Western.	96,995	107,452	89,942
Southwestern ..	49,255	56,699	51,240
Total Western Districts	216,466	242,611	213,087
Total All Roads	572,952	756,416	594,789
Commodities			
Grain and Grain Products	37,898	27,779	29,566
Live Stock	10,619	10,807	12,177
Coal	81,422	171,994	93,921
Coke	4,096	11,304	6,088
Forest Products.	27,501	38,012	29,842
Ore	7,649	12,035	4,703
Merchandise L.C.L.	152,800	170,403	156,233
Miscellaneous ..	250,967	314,082	262,259
March 26	572,952	756,416	594,789
March 19	540,332	754,922	568,851
March 12	556,664	744,499	616,937
March 5	552,916	730,329	634,570
February 26 ...	511,930	692,393	672,869
Cumulative Total, 12 Weeks	6,634,738	8,464,072	7,360,011

In Canada.—Loadings for the week ended March 26 totaled 42,948, as compared with 45,567 last year and 44,627 in the preceding week, according to the statement of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
March 26, 1938.....	42,948	21,897
March 19, 1938.....	44,627	22,327
March 12, 1938.....	45,911	23,189
March 27, 1937.....	45,567	29,060
Cumulative Totals for Canada:		
March 26, 1938.....	538,520	267,258
March 27, 1937.....	560,541	335,154
March 21, 1936.....	500,209	270,230

B. & O. Honors Employees; Averted Bad Collision

The Baltimore & Ohio management, through C. W. Van Horn, general manager, has presented a gold watch to each of three employees in recognition of meritorious service rendered in connection with a freight train derailment at Great Cacapon, W. Va., on December 1, 1937. Recipients of the awards, Guy Mason, brakeman, Cumberland, Md., R. E. Werking, fireman, Martinsburg, Va., J. B. Myers, engineer, Brunswick, Md., through their quick action, warned the engineman of pas-

senger train No. 7 of the fouling of its track by derailment of the engine and eleven cars of a freight train on the adjoining track so that he succeeded in slowing down his train to 20 miles an hour before it struck the wrecked freight cars scattered in its path.

Hearings on Motor Carrier Act Amendments

Hearings before a sub-committee of the Senate Interstate Commerce Committee on S. 3606, the Interstate Commerce Commission's proposed amendments to the Motor Carrier Act, were concluded last week, except for rebuttal evidence to be offered by Commissioner Eastman. At the March 31 hearing, Senator Shipstead withdrew his amendment because it appeared to be "controversial" in nature and because he did not want to impede the passage of the commission's amendments.

Among the organizations appearing in opposition to the bill was the American Trucking Associations, Inc., which objected to giving the commission discretionary power to suspend operating rights without a hearing. John E. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, told the committee that in general, the state commissions were in accord with the Interstate Commerce Commission on S. 3606. He submitted an amendment requested by his association, the effect of which would be to relieve all carriers operating wholly within a state from getting a certificate or a permit from the federal commission to handle interstate traffic if such carriers held a certificate or other form of authority to operate from a board of a state.

Club Meeting

Congressman Samuel B. Pettengill of Indiana will be the guest speaker at the Traffic Club of Philadelphia, Pa., at its meeting on April 11, to be held in the Warwick Hotel, Philadelphia, at 6:30 p. m.

The Car Foremen's Association of Chicago will hold its next meeting on April 11, at the La Salle hotel, Chicago. M. E. Fitzgerald, general car inspector, Chicago & Eastern Illinois at Danville, Ill., will present a paper entitled "What are Delivering Line Defects."

The Pacific Railway Club will hold its next meeting on April 14, at 7:30 p. m., in the Key System auditorium, Oakland, Cal. The topic of the program is to be "Locomotive Safety Appliances." John Dickson, master mechanic, Spokane, Portland & Seattle, at Vancouver, Wash., will discuss "Low Water Alarms"; E. E. Gleason, assistant to superintendent of motive power, Western Pacific, at Sacramento, Cal., will discuss "Safety Valves, Steam Gauges, Cocks, etc." Frank Longo, boiler and welding supervisor, Southern Pacific, at Los Angeles, Cal., will discuss "Drop and Fusible Plugs."

The Car Department Association of St. Louis, Mo., will hold its next meeting on April 19, at 8 p. m., in the Hotel Mayfair, St. Louis. F. L. Murphy, principal engineer, Pullman-Standard Car Manufacturing Company, of Chicago, will present a sound film on light-weight passenger car construction, a silent film on light weight freight car construction, and slides on air conditioning.

Motor Hours-of-Service Case Reopened

The Interstate Commerce Commission has reopened for oral argument at Washington, D. C., on April 25 the Ex Parte No. MC-2 case involving maximum hours of service of motor carrier employees. Division 5's decision, which was reviewed in the *Railway Age* of January 8, page 127, prescribed, for common and contract motor carriers, flexible hours-of-service regulations, providing as maxima a 60-hour week or not more than 70 hours in any period of eight consecutive days, with limits of 15 hours "on duty" and 12 hours "at work" in any period of 24 consecutive hours. Also, the decision sanctioned "properly designed and equipped sleeper cabs."

The reopening came after the filing of a joint petition by the American Federation of Labor, the International Brotherhood of Teamsters, Chauffeurs, Stablemen & Helpers of America, the Amalgamated Association of Street & Electric Railway Employees of America and the International Association of Machinists. As reported in the *Railway Age* of January 15, page 167, William Green, president of the A. F. of L., protested against the decision in a letter to Interstate Commerce Commissioner Joseph B. Eastman. The latter pointed out in his reply that Division 5's action was subject to appeal to the whole commission.

Atlantic Board Sees 16.2 Per Cent Drop in Carloadings

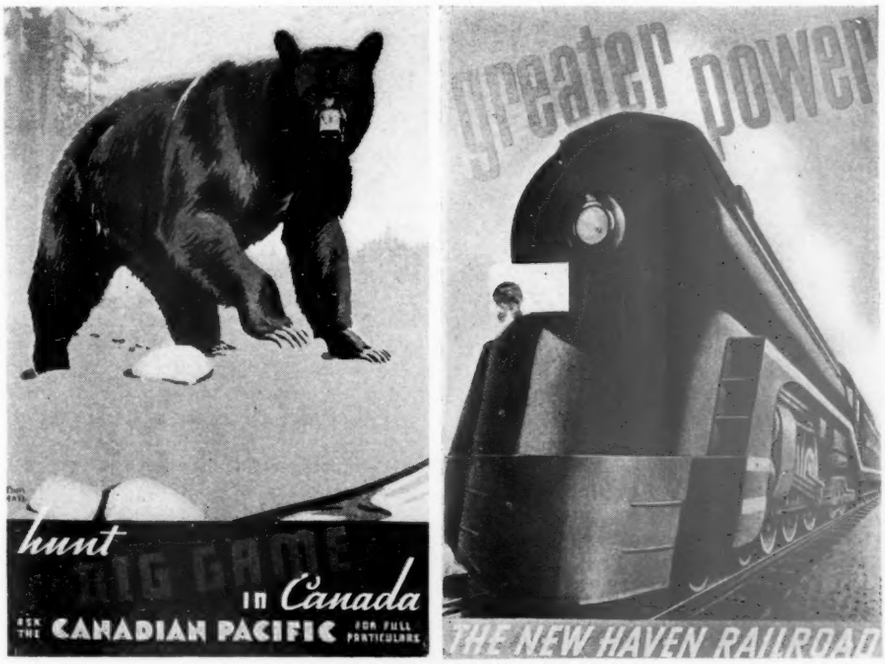
The Atlantic States Shippers Advisory Board forecasts that carloadings for the second quarter of the year will be 16.2 per cent under the record for the same quarter of 1937. This prediction was compiled from commodity committee reports submitted at the 46th regular meeting of the board held in the Hotel Abraham Lincoln, Reading, Pa., on April 6 and 7. Significant decreases were predicted in carloadings of automobiles and trucks, 36 per cent; automobile parts, 35 per cent; coal and coke, 10 per cent; iron and steel, 45 per cent. Increases were predicted only in dairy and poultry products, 4 per cent; fresh fruits, 51 per cent (due to large warehouse holdings); and potatoes, 25 per cent.

A brighter note was sounded for l. c. l. loadings, due, it was reported, to a special "hand-to-mouth" condition in current buying, prohibitive minimum motor truck charges, improved through car service and new merchandise car schedules recently adopted by the carriers.

At a special meeting held on the evening of April 6, over 300 shippers, receivers and railroad representatives were addressed by Messrs. C. H. Dietrich, executive vice-chairman, Freight Claim division, Association of American Railroads; Edward Dahill, chief engineer, Freight Container Bureau, A. A. R.; and representatives of the Claim Conference of the Eastern railroads on subjects pertaining to freight loss and damage prevention. At a joint meeting held with the Reading Traffic Club, Chamber of Commerce and other civic interests, M. J. Gormley, executive assistant to the president, A. A. R., spoke on the subject "The General Railroad Situation."

Railroad Posters Win Out Over All Classes at Poster Show

Railroad advertising demonstrated its superiority in artistic merit over all other classes in graphic publicity mediums when the Canadian Pacific and the Associated British & Irish Railways won the grand awards of the American and foreign sections, respectively, of the first annual small poster contest, the entries to which will



The C. P. Poster, at the Left, Won the Grand Award at the First Annual Small Poster Exhibit. The New Haven Entry at the Right, Took Second Prize in the Travel Section

remain on exhibit in the west concourse, Rockefeller Center, New York, until April 12. The entry of the Canadian Pacific, here illustrated, was deemed superior to the posters submitted by all other classes of advertisers entering the competition, including hotels, travel agencies, theatres, food product manufacturers, etc., while the poster of the British railroad travel promotion group headed the list of all foreign entries. Within the travel classes alone, the Canadian Pacific poster also won first prize, while the New Haven and the Northern Pacific entries were awarded second and third prize, respectively, as announced in the *Railway Age* for April 2, page 629.

Accounting Division Cancels Annual Meeting

The "prevailing situation in the rail industry" has prompted the Accounting Division of the Association of American Railroads to cancel its annual meeting which had been scheduled for June 28-30 at the Royal York Hotel, Toronto, Ont. This action was taken after a canvass to secure the views of the chief accounting officers comprising the membership of the general committee indicated a practical unanimity of opinion to the effect that the convention should not be held this year, but that the 1939 annual session should be held at Toronto, the place previously designated for this year's meeting.

Meanwhile the reports of the standing committees for the fiscal year ending June 30 will be printed and distributed, and action taken on the recommendations through the medium of a letter ballot.

Milwaukee Magazine Completes Quarter Century

The twenty-fifth anniversary of the inception of the Chicago, Milwaukee, St. Paul & Pacific employees' magazine is being celebrated with a Silver Jubilee issue

J. T. Gillick, Chief Operating Officer, Presented the Wrist Watch to Mrs. Kendall

for April. The anniversary edition recounts happenings of the railroad and its personnel and contains excerpts from 300 preceding issues, arranged in chronological order. Greetings from chief executives are included, while the front cover of the first issue is reproduced.

Carpenter Kendall, who has been the editor since the inception of the magazine, is revealed in the anniversary number to be Mrs. Isabelle C. Kendall, daughter of A. H. V. Carpenter, an early day officer of the road. In recognition of her 25 years service as editor, she was tendered a surprise testimonial reception on April 1, by the general officers of the railroads, at which she was presented with a wrist watch, the gift of her associates. Through the medium of the magazine, Mrs. Kendall assisted in establishing the road's veteran employees association in 1915, which has grown to an organization of 9,000, each member having upwards of 25 years of service. In 1924 the magazine announced the formation of the Milwaukee Road Women's Club, of which Mrs. Kendall, one of the principal organizers, is now president general. The club has 56 chapters with 15,000 members actively engaged in charitable and social work in the communities along the line.

Three Passengers Killed in 1937 Train Accidents

Three passengers lost their lives in train accidents on railroads in this country in 1937, according to complete reports for the year, made public on April 4 by the Association of American Railroads. In 1936, seven passengers lost their lives in train accidents, which include collisions, derailments, locomotive-boiler or other locomotive accidents.

"By a strange coincidence," the A. A. R. statement says, "the only three lives lost in train accidents in 1937 resulted from two accidents on two separate railroads, and took place last November within two days of each other. One was a rear end collision in which one passenger was killed. The other was a derailment in which two passengers lost their lives."

Passengers injured in train accidents in 1937 totaled 536, compared with 742 in 1936.

Fifteen passengers lost their lives in train-service accidents in 1937, compared with ten in 1936. "Train-service accidents," the statement explains, "are minor accidents involved in train operation, in which casualties to persons occur." Of the 15 who lost their lives in train-service accidents in the past year, 10 fell from moving passenger trains while attempting either to get on or off such trains, and one passenger jumped from a moving train. The bodies of four passengers were found along the tracks and it is not known whether they jumped or fell from moving trains.

The railroads handled ten per cent more passenger-miles in 1937 than in 1936.

Wheeler Hearings Brought to Close

(*Continued from page 673*)

detail. The statement begins by pointing out that the A. A. R. is a "voluntary organization, including in its membership something like 99 per cent of the mileage of the Class I railroads of the United States." Also, it is stated that the Association was set up with the primary object "that it shall promote trade and commerce in the public interest, further improve railroad service and maintain the integrity and credit of the industry."

The statement then describes the various departments of the A. A. R. and tells how the work of the Association is carried out. Also, a list is given of the national railroad organizations which were consolidated into the A. A. R. at the time of its formation. "No effort was made," the report continues, "to combine organizations dealing with labor problems (which are outside of the scope of the activities of the Association of American Railroads) or organizations which are purely local and regional, such as the Southeastern Demurrage and Storage Bureau, the Southwestern Car Service Association, the New Orleans Freight and Tariff Bureau, the Official Classification Committee and the like."

Mr. Pelley also calls attention to the fact that an exhibit introduced into the record at one of the hearings showed that for the year 1937, aside from amounts spent for advertising, the cost of all the activities of the Association was $2,354,490. Of this amount about $1,500,000 was expended for the work formerly carried on by the American Railway Association and the Car Service Division. Mr. Pelley also observes that "aside from the amount spent for advertising, the railroad activities concentrated in the Association of American Railroads cost substantially less in the year 1937 than in many previous years prior to the organization of the Association."

The question of A. A. R. board meetings is discussed, and Mr. Pelley asserts that "these sessions of the Board and of the Executive Committee furnish a forum for the consideration of all problems of common interest to the industry. The Board has been called upon to deal with many controversies among railroads, most of which have been adjusted without publicity."

At the time that Judge Fletcher made his request, counsel for the committee asked Mr. Pelley to include in his statement "a careful differentiation between the activities carried on by the present Association of American Railroads and those performed by its predecessor Associations." In defense of his Association, Mr. Pelley pointed out that "the statements above show that prior to the organization of the present Association, there was no national handling of traffic, accounting, financial, research and public relations problems. These activities have been added by the organization of the present Association."

"It is true likewise," he continued, "that the present Association handles matters formerly handled by its predecessors in an entirely different manner than once prevailed. As an illustration, the Law Department has been enlarged so as to give more attention to legislative problems pending both in Congress and in the several States. Many matters are now handled by the Law Department of the Asso-

ciation which were formerly either not handled at all or were under the control of the Law Departments of the several railroads. The matter of advice and assistance as to patents, now under the control of the Association's Law Department, was previously handled by independent, unrelated and unco-ordinated Associations.

"Perhaps the most important differentiating factors grow out of the fact that, under the present Association, 18 important railroad Presidents are meeting monthly and oftener for the purpose of considering all problems peculiar to the railroad industry in every part of the country and seeking solutions for those problems. The Association furnishes a medium for this intense, continuous study of railroad questions and a medium for contact between the railroads and the executive and legislative branches of the Government.

"Reference was made in the record to the fact that for the years 1920 to 1936, inclusive, all of the various railroad associations, including national, regional and local groups, expended something like $184,000,000 in the 17 years. It should be remembered, however, that the gross receipts for the railroads for these years amounted to more than $88,500,000,000, so that the expenditures for all these associations amounted to no more than 21/100's of one per cent.

"It is significant also that the figures show that out of this $184,000,000, no more than $8,000,000 was spent for work which could be considered as in any way concerned with legislation. This covers the total expense of the Association of Railway Executives, the Law Department of the present Association and the total expenditures for State Railroad Associations. The balance of the $184,500,000 mentioned by the Committee's agents was spent to do for the railroads as a whole, in the Departments of Operation, Traffic and Accounting, work which would have been done by the individual railroads but for the organization and existence of the local, regional and national associations."

* * *

Miss Martha Moore, Editor of the Frisco Magazine, Recently Elected President of the American Railway Magazine Editors' Association

Equipment and Supplies

Freight Cars Big Item for March

Roads buy 10 locos; 682 freight and 1 passenger car in March; Canada up

The domestic equipment market for March showed a substantial increase in the purchase of freight cars, a drop in locomotive orders and an almost complete quiescence in passenger-train car volume. Manufacturers received orders during the month for 10 locomotives, 682 freight cars and 1 passenger-train car; this compares with orders received during February for 17 locomotives, 109 freight cars and 50 passenger-train cars. Canadian builders recorded orders for 25 locomotives during March, while 2,829 freight cars were purchased. In February Canadian equipment firms received orders for 2,000 freight cars and 16 passenger-train cars.

The March locomotive purchases were comprised entirely of a single order for 10 Diesel-electric switchers. Freight car volume was swelled by Bangor & Aroostook purchases of 500 box, 50 rack and 115 hopper cars.

Rail orders for the month totaled 59,025 tons, compared with a single order for 2,890 tons received during February.

Domestic Equipment Orders Reported in Issues of The Railway Age in March, 1938

LOCOMOTIVES

Date	Name of Company	No.	Type	Builder
Mar. 19	Chicago, Rock Island & Pacific (Leased)	10	Diesel-electric Sw.	Electro-Motive Corp.

FREIGHT CARS

Mar. 12	Bangor & Aroostook.....	500	Box	Magor Car Corp.
		50	Rack	Greenville Steel Car Co.
		115	Hopper	Bethlehem Steel Co.
Mar. 19	Phillips Petroleum Co.....	10	Tank	General American
Mar. 26	U. S. Navy Dept.....	5	Flat	American Car & Foundry
		1	Hopper	American Car & Foundry
		1	Flat	Haffner-Thrall Car Co.

PASSENGER-TRAIN CARS

Mar. 12	Bangor & Aroostook.....	1	Baggage-Mail	Pullman-Standard

FREIGHT CARS

THE CARNEGIE-ILLINOIS STEEL CORPORATION contemplates having repairs made to 60 coke hopper cars of 50 tons' capacity.

THE SOUTH AFRICAN RAILWAYS & HARBOURS contemplate buying from 500 to 1,000 drop-end gondola cars of 40 tons' capacity. T. H. Watermeyer is general manager at Johannesburg, South Africa.

THE UNITED STATES NAVY DEPARTMENT, BUREAU OF SUPPLIES AND ACCOUNTS, Washington, D. C., has received bids for 6 cars. Inquiry for this equipment was recorded in the *Railway Age* of March 26, page 585. The low bidders were as follows: Magor Car Corporation, 1 box car; American Car & Foundry Company, 2 tank cars; Haffner-Thrall Car Company, 3 flat cars.

THE FERROCARRIL DE ARICA A LA PAZ is considering the question of purchasing 50 flat cars and 50 box cars, all of 30 tons' capacity. Juan Waidele is general manager at Arica, Chile.

THE MATHIESON ALKALI WORKS, INC., is inquiring for from three to five tank cars of 40 tons' capacity. This company has placed an order with the American Car & Foundry Co. for three transport cars of 50 tons' capacity for solid CO_2.

THE PERUVIAN CORPORATION, LTD., operating railroad lines in Peru, South America, contemplates buying 30 flat cars of 35 tons' capacity. O. R. H. Bury is chairman and managing director, 140 Leadenhall street, E. C. 3, London, England.

IRON AND STEEL

THE DELAWARE, LACKAWANNA & WESTERN has ordered 1,200 tons of 131-lb. rail from the Bethlehem Steel Company.

THE MISSOURI PACIFIC has ordered 32,400 tons of rails, including 22,000 tons of 112 lb. and 10,400 tons of 90 lb. rail, from the Colorado Fuel & Iron Co., the Tennessee Coal, Iron and Railroad Co., the Carnegie-Illinois Steel Corporation, the Bethlehem Steel Company and the Inland Steel Company.

Construction

CHICAGO & NORTH WESTERN—The Chicago & North Western will restore its shops at South Pekin, Ill., which were destroyed by the tornado that swept through this vicinity on March 30. Damage to the shops and other property of the railroad is estimated at $100,000.

PENNSYLVANIA.—A contract has been given to W. F. Trimble & Sons Co., Pittsburgh, Pa., for the construction of a banana ripening building at 21st and Pike streets, Pittsburgh.

Supply Trade

Koppers Company

The annual report of Koppers Company, Pittsburgh, Pa., for 1937 shows net sales and operating revenues of $47,374,871, an increase of approximately 28 per cent over the previous year. Net profit from operations before depreciation was $5,033,325, compared with $4,372,167 in 1936. Other income, which was derived principally from dividends and interest, totaled $1,254,642, as compared with $2,158,664 in the preceding year. This reduction was due, in large measure, to the sale, in 1936, of income-producing assets whose proceeds were used to reduce the company's term debt. The total income after deductions for depreciation, amortization and other items, totaled $4,829,383, as compared with $4,940,332 in the previous year. This income after federal taxes became $3,374,589, as compared with $3,065,629 in 1936. Preferred stock dividends amounting to $1,200,000 and common stock dividends amounting to $290,000 were paid during the year.

The principal addition to investments during the year was the acquisition, in January, 1937, of one-third of the common stock of the Virginian Corporation, which owns somewhat less than 40 per cent of the voting shares of the Virginian Railway Company. During the year the company paid bank loans amounting to $600,000, while expenditures for additions to property amounted to $1,490,703 and $1,451,103 was advanced to subsidiary companies for additional working capital.

F. B. Ernst, vice-president of the American Steel Foundries, Chicago, has been elected a director.

H. S. Strouse, treasurer of the Harnischfeger Corporation, Milwaukee, Wis., has been elected vice-president and will continue to direct the activities of the treasurer's department.

The Graybar Electric Company, Inc., New York, has opened a new office at 1927 Main street, Columbia, S. C., with **J. H. Littleton, Jr.** as manager. The company has moved its Wichita, Kan. office from 323 South Wichita street to 424 North Rock Island avenue.

The United States Steel Corporation, at a meeting of its board on April 5, elected **Edward R. Stettinius, Jr.** as chairman of the board, succeeding **Myron C. Taylor,** and Mr. Stettinius retired from the chairmanship of the finance committee. **Edward M. Voorhees** retired as vice-chairman of the finance committee and was elected chairman of that committee. **Benjamin F. Fairless** was re-elected president of the United States Steel Corporation of New Jersey and becomes the chief administrative officer. Mr. Fairless is also president of the United States Steel Corporation of Delaware, the management corporation, with which the principal manufacturing subsidiaries have management contracts, with headquarters at Pittsburgh, Pa. **Philip R. Clarke,** president of the City National Bank & Trust Company of Chicago, was elected a member of the board of directors to succeed **E. J. Buffington,** deceased.

Dan W. Hirtle, vice-president of the **Burgess Battery Company** with headquarters at Chicago, has been elected president to succeed **C. F. Burgess,** who has been elected chairman of the board of directors. Mr. Hirtle was born at Malden, Mass., on September 18, 1895. He was educated in the Pawtucket (R. I.) public schools and attended Rhode Island State College for a year, after which, in 1914, he became a timekeeper for the Willmarth & McKillop Construction Co. In 1916 he was appointed a construction foreman for Stone & Webster. During the war he served in the 73rd Artillery, where he earned a Distinguished Service medal. In 1919 he returned to Stone & Webster, but resigned a year later to enter the employ of United Engineers & Constructors, Inc., as field engineer on the construction of the Procter & Gamble plant at Dallas, Tex. From 1923 to 1928 he was superintendent of construction on such building projects

Dan W. Hirtle

as the U. S. Embassy at Rio de Janiero, Brazil; the Lehigh Portland Cement Co. plant at Birmingham, Ala.; the Southern Railway's shops at Brimingham, Spartanburg, S. C., Princeton, Ind., and Chattanooga, Tenn.; the Mobile & Ohio shops at Jackson, Tenn.; and the Southern Pacific freight terminal at Houston, Tex. In 1929 he joined the F. H. McGraw Co., and in 1931 he became assistant superintendent of the finishing mills of the American Rolling Mill Company, Middletown, Ohio. He entered the employ of the Burgess Battery Company in 1933 as general superintendent of the Freeport (Ill.) division, and was promoted to production manager in 1935, to general manager in 1936 and vice-president in 1937.

The Jones & Laughlin Steel Corporation, Pittsburgh, Pa., has appointed three new assistant general managers of sales; opened a new district sales office at Baltimore, Md.; and made promotions and new appointments in several of its district sales offices. **R. T. Rowles** has been appointed assistant general manager of sales and will supervise the general activities of the hot rolled, cold finished, wire products, and warehouse sales departments. He entered the service of Jones & Laughlin in 1912 and in 1925, was appointed manager of hot rolled sales. **W. H. Wiewel,** has been appointed assistant general manager of sales and will supervise the general activities of by-products and pig iron, sheets and strip, tinplate, and tubular products sales departments. He joined Jones & Laughlin in 1935 as manager of sales of tubular products and had previously entered the steel business in 1910, with the Cambria Steel Company. **H. J. Watt,** has been appointed assistant general manager of sales and will have charge of New York City and the East, with general supervision over district sales offices in Boston, Mass., New York, Philadelphia, Pa., Atlanta, Ga., and the new district sales office in Baltimore. Since 1935, Mr. Watt has served as district sales manager at New York. He entered the steel business in 1912, in the Philadelphia office of the Carnegie Steel Company and since 1925 has been in the service of Jones & Laughlin. **Arthur A. Wagner,** assistant manager of hot rolled sales, has been appointed manager of hot rolled sales,

R. T. Rowles

W. H. Wiewel

succeeding Mr. Rowles; **John O'H. Anderson,** assistant district sales manager at New York, has been appointed manager of sales, tubular products, succeeding Mr. Wiewel, and **E. J. Dickson,** has

been appointed assistant manager of sales, tubular products, at Pittsburgh. The following have been appointed district sales managers: **V. A. Jevon,** at Baltimore, Md.; **John B. DeWolf,** Philadelphia,

H. J. Watt

Pa.; **Edward H. Hughes,** St. Louis, Mo.; **Thomas C. Ham,** having been transferred from Philadelphia to Pittsburgh, to supervise the corporation's industrial training plan and **J. B. Hungate,** having resigned. Assistant district sales managers have been appointed as follows: **H. R. Dorney,** at Baltimore; **Herbert B. Spackman,** Philadelphia; **William K. Breeze,** New York; **Hughart R. Laughlin,** New York; **F. B. Kittredge,** Boston, Mass and **Charles M. Mason,** Buffalo, N. Y.

OBITUARY

Arnold Stuart Durrant, honorary vice-president of the International General Electric Company, died on March 22, at his home in New York at the age of 68 years. Mr. Durrant was vice-president in charge of sales from 1926 until 1931, when he retired, after 41 years of service in this industry.

John E. Bradley, former president of the Osgood Bradley Car Company, Worcester, Mass., died on April 4, at the age of 78, while vacationing in Bermuda. The business was founded by his grandfather as a stage coach manufacturer in 1848, and later developed into the production of railroad cars and trolley equipment. The company was sold in 1930, and is now part of the Pullman-Standard Car Manufacturing Company.

Joseph Woodley Gosling, decorative designer for the General Electric's illuminating engineering laboratory since 1912, died on April 4 at Schenectady, N. Y., at the age of 59 years. Mr. Gosling's connection with the company has been associated with nearly every principal lighting installation made by General Electric, including every world's fair since the Panama-Pacific Exposition at San Francisco. He also assisted in the designing of equipment for other fields, including refrigerators and air conditioning, and in recent years frequently collaborated with railroad officials in styling Diesel-electric trains and other rolling stock.

Financial

BANGOR & AROOSTOOK.—*Equipment Trust Certificates.*—This company has sold $1,500,000 of 2½ per cent equipment trust certificates to the Equitable Life Assurance Society at 98.96.

BANGOR & AROOSTOOK.—*Annual Report.*—The annual report of this company for the year ended December 31, 1937, shows net income after interest and other charges of $845,224, an increase of $97,972 as compared with net income in 1936. Selected items from the income account follow:

	1937	Increase or Decrease Compared with 1936
RAILWAY OPERATING REVENUES	$6,185,676	$200,555
Maintenance of way	1,081,154	25,496
Maintenance of equipment	1,082,048	45,093
Transportation	1,553,314	9,012
TOTAL OPERATING EXPENSES	4,100,561	112,788
Operating ratio	66.29	–.34
NET REVENUE FROM OPERATIONS	2,085,115	87,767
Railway tax accruals	547,704	–11,532
Railway operating income	1,537,410	99,299
Net rents	25,759	–20,957
NET RAILWAY OPERATING INCOME	1,511,650	78,342
Other income	70,027	26,607
TOTAL INCOME	1,581,678	104,949
Interest on funded debt	711,141	1,743
TOTAL FIXED CHARGES	724,211	1,540
NET INCOME	$845,224	$97,972

BESSEMER & LAKE ERIE.—*Annual Report.*—The annual report of this company and its leased lines for the year ended December 31, 1937, shows net income after interest and other charges of $6,785,381, as compared with net income of $5,929,613 in 1936. Selected items from the consolidated income account follow:

	1937	1936	Increase or Decrease
RAILWAY OPERATING REVENUES	$17,585,188	$15,467,347	$2,117,840
Maintenance of way			
Maintenance of equipment			
Transportation			
TOTAL OPERATING EXPENSES	8,498,787	7,593,566	905,221
Operating ratio			
NET REVENUE FROM OPERATIONS	9,086,400	7,873,781	1,212,619
Railway tax accruals	2,142,778	1,721,022	421,756
Railway operating income	6,943,621	6,152,759	790,862
Net rents	615,675	567,718	47,956
NET RAILWAY OPERATING INCOME	7,559,297	6,720,477	838,819
Other income	78,752	104,773	—26,020
TOTAL INCOME	7,638,049	6,825,251	812,798
Rent for leased roads	5,962	5,952	10
Interest on funded debt	803,679	627,916	175,762
TOTAL FIXED CHARGES	810,574	642,000	168,574
NET INCOME	$6,785,381	$5,929,613	$855,768

BOSTON & MAINE.—*Annual Report.*—The annual report of this road for the year ended December 31, 1937, shows net income, after interest and other charges, of $202,220, an increase of $1,856,403 as compared with the 1936 figure. Selected items from the income account follow:

	1937	Increase or Decrease Compared with 1936
RAILWAY OPERATING REVENUES	$46,372,693	–$145,465
Maintenance of way	6,188,112	–721,947
Maintenance of equipment	7,238,607	–179,973
Transportation	18,267,770	–352,296
TOTAL OPERATING EXPENSES	34,614,104	1,389,508
Operating ratio	74.65	–2.75
NET REVENUE FROM OPERATIONS	11,758,588	1,244,042
Railway tax accruals	2,854,120	–481,974
Railway operating income	8,904,468	1,726,017
Equipment and Joint facility rents—Net Dr.	2,355,598	30,334
NET RAILWAY OPERATING INCOME	6,548,869	1,695,682
Other income	1,200,205	71,273
TOTAL INCOME	7,749,074	1,766,956
Rent for leased roads	1,243,247	714
Interest on funded debt*	5,555,277	–75,540
TOTAL FIXED CHARGES	7,481,246	–71,553
NET INCOME	$202,220	1,856,403

* Interest amounting to $4,353.34 for 1937 and $190,666.25 for 1936 accrued on bonds of Boston & Maine R. R. held in Sinking Fund is included in account "Income Applied to Sinking Funds."

CANTON & CARTHAGE.—*Note.*—The company has applied to the Interstate Commerce Commission for authority to issue a promissory note for $280,000, to be dated January 1, 1938 and maturing in five years.

CENTRAL VERMONT.—*Abandonment.*—Examiner J. S. Prichard of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that it authorize this company to abandon the Burlington & Lamoille branch, extending easterly from a connection with its main line at Essex Junction, Vt., to a connection at Cambridge Junction with the main line of the St. Johnsbury & Lake Champlain, 25.8 miles.

CHICAGO & NORTH WESTERN.—*Reorganization.*—The Interstate Commerce Commission, Division 4, has denied the petition of the common stockholders for a postponement of six months in the reorganization proceedings of this company pending an investigation of the possibilities of consolidating this company with the Chicago, Milwaukee, St. Paul & Pacific.

CHICAGO, ROCK ISLAND & PACIFIC.—*Reorganization plan.*—At the request of certain bondholders' committees, further hearings before the Interstate Commerce Commission on the company's plan of reorganization have been postponed until June 28. It is expected, according to a statement by J. E. Gorman, corporate president, to stockholders, that prior to that time a new plan will be filed by representatives of bondholders, which will embody the results of studies now in progress by the trustees and by various committees. The commis-

sion, the statement continues, has indicated that the next hearing will be final, and it is hoped that a plan of reorganization may be approved and certified to the court by the commission during the current year.

DELAWARE & HUDSON.—*Annual Report.* The annual report of the Delaware & Hudson Railroad Corporation for the year ended December 31, 1937, shows net deficit, after interest and other charges, of $998,164, as compared with net deficit of $926,695 in 1936. Selected items from the income account follow:

	1937	1936	Increase or Decrease
RAILWAY OPERATING REVENUES	$25,234,728	$25,375,850	-$141,122
TOTAL OPERATING EXPENSES	20,898,135	20,641,763	256,371
Operating ratio	82.81	81.34	1.47
NET REVENUE FROM OPERATIONS	4,336,592	4,734,086	397,493
Railway tax accruals	1,439,050	1,661,615	-222,564
Railway operating income	2,897,542	3,072,471	174,928
Hire of freight Cars	*10,611	144,510	-155,122
Joint facility rents—Net	127,956	154,222	-26,266
NET RAILWAY OPERATING INCOME	2,787,892	3,132,603	-344,711
Other income	206,309	198,215	8,094
TOTAL INCOME	2,994,202	3,330,819	-336,616
Rent for leased roads	1,786,261	1,786,261	.....
Interest on funded debt	2,142,500	2,417,500	275,000
NET INCOME DEFICIT	$998,164	$926,695	$71,469

* Debit.

DULUTH, SOUTH SHORE & ATLANTIC.—*Annual Report.*—The annual report of this company for the fiscal year ended December 31, 1937, shows net deficit after interest and other charges, of $462,942, as compared with net deficit of $296,184 in 1936. Selected items from the condensed statement follow:

	1937	1936	Increase or Decrease
GROSS REVENUE	$2,846,273	$2,913,041	—$66,768
OPERATING EXPENSES	2,146,299	2,019,843	126,456
NET REVENUE	699,973	893,197	—193,224
Net Rents and Taxes—Dr.	236,464	256,003	—19,539
NET RAILWAY OPERATING INCOME	463,509	637,194	—173,685
Other Income—Net	18,634	15,726	2,908
Income Available for Fixed Charges	482,143	652,920	—170,777
FIXED CHARGES	945,086	949,105	—4,019
NET DEFICIT	$462,942	$296,184	$166,758

GALVESTON TERMINAL.—*Bonds.*—The Interstate Commerce Commission, Division 4, has authorized this company to extend from March 1, 1938, to March 1, 1948, the date of maturity of $546,500 of first mortgage gold bonds, with interest at the rate of five per cent.

ERIE.—*Annual Report.*—The annual report of this company for the year ended December 31, 1937, shows net deficit, after interest and other charges, of $433,293, as compared with net income of $2,195,014 in 1936. Selected items from the income statement follow:

	1937	1936	Increase or Decrease
RAILWAY OPERATING REVENUES	$83,925,726	$85,005,111	-$1,079,384
Maintenance of way	7,182,471	6,993,378	189,092
Maintenance of equipment	16,643,360	15,711,879	931,481
Transportation	31,703,600	30,505,475	1,198,125
TOTAL OPERATING EXPENSES	60,997,803	58,882,551	2,115,252
Operating ratio	72.68	69.27	3.41
NET REVENUE FROM OPERATIONS	22,927,922	26,122,560	-3,194,637
Railway tax accruals	5,516,580	6,114,339	-597,759
Railway operating income	17,411,342	20,008,220	-2,596,878
Net Rents—Dr.	3,797,333	3,669,430	127,903
NET RAILWAY OPERATING INCOME	13,614,008	16,338,790	-2,724,782
Other income	1,186,046	1,298,099	-112,053
TOTAL INCOME	14,800,054	17,636,890	-2,836,835
Rent for leased roads	1,988,354	1,991,596	-3,242
Interest on funded debt	12,192,294	12,071,816	120,478
TOTAL FIXED CHARGES	14,551,610	14,715,801	-164,190
NET INCOME	*$433,293	$2,195,014	-$2,628,307

* Deficit.

LONG ISLAND.—*Annual Report.*—The annual report of this road for the year ended December 31, 1937, shows net deficit after interest and other charges, of $2,115,811, an increase of $957,780 over net deficit in 1936. Selected items from the income statement follow:

	1937	Increase or Decrease Compared with 1936
RAILWAY OPERATING REVENUES	$24,586,448	-$938,929
Maintenance of way	2,614,956	367,247
Maintenance of equipment	4,787,660	80,216
Transportation	11,659,244	36,329
TOTAL OPERATING EXPENSES	19,822,530	206,337
Operating ratio	.....	.....
NET REVENUE FROM OPERATIONS	4,763,918	1,145,267
Railway tax accruals	3,049,644	89,551
Railway operating income	1,714,273	1,055,715
Hire of Equipment—Dr.	333,928	27,282
Joint facility rents—Dr.	1,556,599	54,728
NET RAILWAY OPERATING INCOME*	176,253	973,704
Non-operating income	604,679	231,981
GROSS INCOME	428,426	741,722
Rent for leased roads	60,000	.....
Interest on funded debt	2,190,644	173,436
TOTAL DEDUCTIONS FROM GROSS INCOME	2,544,238	216,058
NET DEFICIT	$2,115,811	$957,780

* Deficit.

MARYLAND & PENNSYLVANIA.—*R. F. C. Loan Extension.*—This company has applied to the Interstate Commerce Commission for approval of an extension from May 1, 1938, to May 1, 1940, of the maturity of a Reconstruction Finance Corporation Loan outstanding in the amount of $147,000.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Reorganization.*—The Railway Labor Executives' Association has filed with the Interstate Commerce Commission a brief in opposition to the ratification of Joseph Chapman's appointment as co-trustee of this property. The brief asserts, among other allegations, that the confirmation of Mr. Chapman, who "has throughout his life been opposed to dealing with employees by collective bargaining," would "jeopardize the interests and well-being" of the Soo Line's 8,000 employees.

MOBILE & OHIO.—*Annual Report.*—The annual report of this road for the year ended December 31, 1937, shows net deficit, after interest and other charges, of $647,438, as compared with net deficit of $377,644 in 1936. Selected items from the income statement follow:

	1937	1936	Increase or Decrease
RAILWAY OPERATING REVENUES	$12,104,794	$10,847,701	$1,257,093
Maintenance of way	1,568,730	1,321,654	247,076
Maintenance of equipment	2,625,238	2,196,513	428,725
Transportation	4,424,010	3,854,835	569,175
TOTAL OPERATING EXPENSES	9,702,025	8,363,535	1,338,490
NET REVENUE FROM OPERATIONS	2,402,768	2,484,166	—81,398
Railway tax accruals	674,320	596,925	77,395
Hire of equipments	415,052	259,283	155,769
Joint facility rents	382,936	365,250	17,686
NET RAILWAY OPERATING INCOME	930,460	1,262,705	—332,245
Other income	56,899	54,580	2,319
TOTAL INCOME	987,360	1,317,286	—329,926
Rent for leased roads	1,418	1,418	....
TOTAL FIXED CHARGES	1,624,678	1,683,162	—58,484
NET DEFICIT	$647,438	$377,644	$269,794

NEW YORK, NEW HAVEN & HARTFORD.—*Equipment Trust Certificates.*—Trustees have sold $1,640,000 of 3¾ per cent equipment trust certificates of this company to a syndicate headed by Salmon Brothers & Hutzler at 99.0562.

PENNSYLVANIA.—*Collateral of Pennsylvania Company.*—This road has applied to the Interstate Commerce Commission for a supplemental order in Finance Docket No. 1466, which would authorize the Pennsylvania Company to pledge stock of the Pittsburgh, Cincinnati, Chicago & St. Louis as additional collateral with the trustee of the Pennsylvania Company's 28-year 4 per cent secured bonds, dated August 1, 1935, and outstanding in the amount of $49,000,000. The commission's order of July 10, 1922, as amended October 2, 1923, in No. 1466 authorized the P. R. R. to control the P. C. C. & St. L., with the stipulation that neither the P. R. R.

nor the Pennsylvania Company pledge or otherwise dispose of P. C. C. & St. L. stock without the consent of the commission. The Pennsylvania Company now anticipates that "prevailing and future market conditions" may require it to pledge its 300,000 P. C. C. & St. L. shares or part thereof for the above-stated purpose; although the application goes on to say that "such pledge is not an act of applicant" (P. R. R.) and the Pennsylvania Company "is not a party to this proceeding and is neither a common carrier by railroad nor a corporation organized for the purpose of engaging in railroad transportation" subject to the Interstate Commerce Act. Also, the application "is filed without prejudice to such legal rights as the Pennsylvania Company may have to pledge such stock without first obtaining the consent of the Interstate Commerce Commission."

SALT LAKE & UTAH.—*Acquisition.*—The Interstate Commerce Commission, Division 4, has authorized the Salt Lake & Utah Railroad Corporation to acquire the properties of the Sale Lake & Utah Railroad Company.

SOUTHERN PACIFIC.—*RFC Loan.*—This company has asked the Interstate Commerce Commission to approve its amended application for a $14,000,000 Reconstruction Finance Corporation loan so that it may use only $1,000,000 for flood damage repairs and the balance of $13,000,000 for equipment trust maturities. Originally the company had asked for $5,000,000 for flood rehabilitation. The supplemental application states that the company will have to have $5,000,000 on May 2, $2,500,000 on June 1, $3,500,000 on July 1, and $3,000,000 on August 1.

SPOKANE INTERNATIONAL. — *Abandonment.*—The trustee of this road has applied to the Interstate Commerce Commission for authority to abandon operations on the Coeur D'Alene & Pend D'Oreille's Bayview branch, extending from Corbin Junction, Idaho, to Bayview, 11.61 mi.

WILKES-BARRE & SCRANTON.—*Bond Maturity.*—This company has applied to the Interstate Commerce Commission for authority to extend from May 1, 1938, to May 1, 1948, the maturity date of its 4½ per cent first mortgage bonds outstanding in the amount of $500,000.

YADKIN.—*Abandonment.*—This road has applied to the Interstate Commerce Commission for authority to abandon a 9.53-mile section of its line from a point near Albemarle, N. C., to Norwood.

Average Prices of Stocks and Bonds

	Apr. 5	Last week	Last year
Average price of 20 representative railway stocks..	22.56	20.25	58.15
Average price of 20 representative railway bonds..	55.11	53.19	81.71

Dividends Declared

Carolina, Clinchfield & Ohio—$1.00, quarterly, payable April 20 to holders of record April 9.

Cincinnati, Sandusky & Cleveland.—Preferred, $1.50, payable May 2 to holders of record April 15.

Norfolk & Western.—Preferred, $1.00, quarterly, payable May 19 to holders of record April 30.

Railway Officers

EXECUTIVE

G. F. Dodge, tax commissioner and special representative for the Denver & Rio Grande Western, has had his title changed to director of public relations. He will continue to make his headquarters at Denver, Col.

J. S. Pyeatt, president of the Denver & Rio Grande Western, with headquarters at Denver, Col., has been elected chairman of the Missouri Pacific, the New Orleans, Texas & Mexico, and the Internation-Great Northern (all units of the Missouri Pacific System), succeeding **G. A. Tomlinson.**

H. J. Plumhof, formerly general manager of the South Central district of the Union Pacific, with headquarters at Salt Lake City, Utah, has been elected vice-president and general manager of the Utah Idaho Central, with headquarters at Ogden, Utah.

John T. Cochrane, Jr., vice-president and traffic manager of the Alabama, Tennessee & Northern, has been appointed trustee to succeed his father, John T. Cochrane, whose death on January 12 was reported in the *Railway Age* of January 15. Mr. Cochrane will continue to make his headquarters at Mobile, Ala.

H. B. Stewart, Jr., general manager, has been appointed co-trustee of the Akron, Canton & Youngstown and the Northern Ohio, succeeding **Harry B. Stewart,** whose death on January 12 was reported in the *Railway Age* of January 15. The new co-trustee will make his headquarters at Akron, Ohio.

Robert K. McClain, whose appointment as assistant vice-president of the Southern, with headquarters at Washington, D. C., was noted in the *Railway Age* of March 26, was born on August 10, 1887, at Gowensville, S. C. He was educated in the grammar school and Clemson College and entered railroad service in 1903 with the Southern as telegraph operator at Asheville, N. C. In 1907 Mr. McClain became train dispatcher; in 1916, assistant chief dispatcher; in 1917, chief dispatcher; in 1919, trainmaster; and in 1926, superintendent, all at Asheville. He was appointed superintendent transportation at Knoxville, Tenn., in 1927, and became general superintendent transportation at Cincinnati, Ohio, in 1931. Mr. McClain was transferred in the latter capacity to Knoxville in 1934, the position he held until his recent appointment as assistant vice-president, at Washington, D. C.

FINANCIAL, LEGAL AND ACCOUNTING

J. W. Besch, cashier, paymaster and secretary of the Chicago Union Station Company, has been appointed auditor and secretary and **George E. Shiffer** has been appointed assistant secretary, to succeed **Frederick A. Winkler,** who retired as auditor and assistant secretary on April 1. **A. B. Olson** has been appointed cashier and paymaster.

W. S. Walker has been appointed general attorney for the Missouri & Arkansas, with headquarters at Harrison, Ark.

George M. Glazier, general auditor of revenues, New York Central system, with headquarters at New York, has retired on account of ill health. The office of general auditor, revenues, has been abolished and the activities of that office have been transferred to the office of assistant vice-president and comptroller. **J. Scott Conover,** assistant general auditor, revenues, New York, has been appointed assistant comptroller, with the same headquarters. Mr. Glazier began his railroad career with the Norfolk Southern, in Norfolk, Va., and, in 1906, accepted a position with the treasury department of the New York Central. In 1909 he was sent to Cleveland, Ohio, as assistant auditor of the Lake Shore & Michigan Southern, being promoted in 1910 to auditor of that company. Upon the consolidation of the Lake Shore, with the New York Central, Mr. Glazier went to New York as assistant to the general auditor, which position he held until 1920, when he became auditor of the New York Central. Upon the consolidation of the various properties, he was appointed general auditor of revenues, which position he held at the time of his retirement. Mr. Glazier will reside in St. Petersburg, Fla.

James P. McDonald, auditor of the Coast Lines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., has been promoted to the newly-created position of general statistician for the system, with headquarters at Chicago. He assumes as part of his new

James P. McDonald

responsibilities the duties of **A. L. Conrad,** assistant general auditor, who has retired, effective April 1. **Adolph E. Meyer,** auditor of the Panhandle & Santa Fe (part of the Santa Fe System) at Amarillo, Tex., who succeeds Mr. McDonald, has been succeeded by **Clayton A. Casler,** assistant to the assistant general auditor at Chicago.

Mr. McDonald was born at Bloomington, Ill., in December, 1889. After entering the

service of the Santa Fe at Topeka, Kan., in August, 1913, as traveling accountant, he held successively positions in the mechanical, transportation, and statistical departments. He was appointed auditor of disbursements at Topeka in May, 1933, and became auditor of the Coast Lines on August 1, 1937.

George H. Gardner has been appointed general attorney of the Chesapeake & Ohio, with headquarters at Washington, D. C., as reported in the *Railway Age* of March 26. Mr. Gardner was born on October 31, 1885, attended the public schools of Louisville, Ky., and received his law degree from the Jefferson College of Law in 1911, while employed in the accounting department of the Louisville & Nashville, at Louisville. In 1912, he was transferred to the law department and later became district claims attorney of the Louisville & Nashville, from which position he resigned in April, 1921, to become attorney-examiner in the finance division of the Interstate Commerce Commission at Washington, D. C. He remained with the I. C. C. until July 1, 1923, handling finance cases, and on that date was ap-

George H. Gardner

pointed assistant general attorney of the Chesapeake & Ohio, with headquarters at Richmond, Va. In 1929, Mr. Gardner's headquarters were transferred to Washington, D. C., where he has since been located in representing the Chesapeake & Ohio, principally before the I. C. C. in finance cases. Since going to the C. & O., Mr. Gardner has participated in all important cases before the commission involving the Chesapeake & Ohio system, including the Hocking Valley, Pere Marquette-Erie, Chesapeake & Ohio of Indiana, Nickel Plate-Erie, and other unification and acquistion cases.

David Harris Leake, assistant general solicitor of the Chesapeake & Ohio, has been appointed general attorney, with headquarters at Richmond, Va., as announced in the *Railway Age* of March 26. Mr. Leake was born on July 13, 1875, in Goochland County, Va., and was educated at Charlotte Hall, Md., Washington and Lee University and the University of Virginia. He entered railroad service in 1899 with the Chesapeake & Ohio and was local counsel until 1902, then becoming division counsel for Goochland and adjoining counties, in association with his father. In 1904 he went to Richmond, Va., with en-

David H. Leake

larged jurisdiction as division counsel, and was appointed assistant general solicitor in 1926, the position he held until his recent appointment as general attorney. Mr. Leake was attorney for the commonwealth for Goochland county from 1901 to 1905, being elected Judge of Goochland County Court in the latter year, to fill an unexpired term. He was a member of the House of Delegates of Virginia from Goochland and Fluvanna counties from 1901 to 1904 and was chief of staff to the Governor of Virginia from 1918 to 1922.

Marshall Carter Hall, who has been appointed general solicitor of the Chesapeake & Ohio, as reported in the *Railway Age* of March 26, was born on June 4, 1883, at Fredericksburg, Va. Mr. Hall was educated at Fredericksburg College (B. A., 1900) and the University of Virginia (M. A., 1903; B. L., 1906). He was professor of modern and ancient languages at St. Albans, Radford, Va., in 1904. After serving as attorney for the

M. Carter Hall

American Telephone & Telegraph Company during 1906-1907, he became assistant to general counsel for the Atlantic Coast Line at Petersburg, Va., holding that position until 1912. Mr. Hall then became attorney for Associated Railways & Steamship Lines in the office of the special counsel before the Interstate Commerce Commission, where he remained until 1915. From that year until 1920 he served as assistant division counsel for the Southern and counsel for the Richmond, Fredericksburg & Potomac and the Washington-Virginia Electric Railway Co. From 1915 to 1920 Mr. Hall was also engaged in general practice of law at Fairfax, Va., as a member of the firm of Moore, Keith, McCandlish & Hall, except for the period from September, 1918, to March, 1919, when he was a major, judge-advocate in the United States Army. From 1920 to 1929 he was engaged in the general practice of law at Washington, D. C., on income tax matters, departmental practice, Court of Claims, etc., as a member of the firm of Carlin, Carlin & Hall. Mr. Hall became general attorney for the Chesapeake & Ohio in 1929, the position he held until his recent appointment as general solicitor of the C. & O. and the Pere Marquette, with headquarters at Richmond, Va.

OPERATING

W. B. Kirkland, superintendent of transportation of the Southern Pacific, with headquarters at San Francisco, Cal., has been appointed also superintendent of car service for the Northwestern Pacific.

E. C. Manson, assistant to the general manager of the South-Central district of the Union Pacific, with headquarters at Pocatello, Idaho, has been appointed assistant general manager, with headquarters at Salt Lake City, Utah.

J. D. Tuttle, chief clerk in the perishable freight service department of the Illinois Central at Chicago, has been promoted to supervisor of that department to take over duties formerly handled by **E. F. McPike,** superintendent of perishable freight service, who has retired.

M. J. Byrnes has been appointed assistant to the operating vice-president of the Northern Pacific, with headquarters at St. Paul, Minn., succeeding **S. A. Wilder,** who has retired after 50 years' service with this company. **J. L. Hurd,** assistant general superintendent of transportation at St. Paul has been transferred to Seattle, Wash.

E. H. Piper, assistant to the general manager of the Chicago, Burlington & Quincy at Chicago, has been appointed superintendent of the Centerville division, with headquarters at Centerville, Iowa, succeeding **M. B. Lamb,** who has retired. **L. B. Lyman,** executive assistant at Denver, Colo., has been appointed assistant to the general manager at Chicago, to succeed Mr. Piper, and the position of executive assistant at Denver has been abolished.

J. A. Christie, superintendent of the San Francisco terminals of the Atchison, Topeka & Santa Fe, has been appointed superintendent of the combined Valley and San Francisco Terminal divisions, with

headquarters at Fresno, Cal., and the superintendent's office at China Basin, San Francisco, has been abolished. **G. W. Simpson,** superintendent at Fresno, has been appointed assistant superintendent, with the same headquarters, with jurisdiction over the Calwa-Fresno terminal, second and third districts, and branches radiating therefrom.

M. O. Dunbar, who retired as superintendent of the Charlotte division of the Southern on April 1, as reported in the *Railway Age* of March 26, was born at Stone Mountain, De Kalb County, Ga. Mr. Dunbar entered railway service with the Southern as telegraph operator in March, 1891, and was promoted to train dispatcher in 1901. He became chief dispatcher in 1911 and trainmaster in 1914. In January, 1926, Mr. Dunbar was appointed superintendent of the Spartanburg division, becoming superintendent of the Charlotte division at Greenville, S. C., in July, 1927, the position he held until his retirement.

Melvin E. Tatem, whose appointment as superintendent of the Columbia division of the Southern, at Columbia, S. C., was announced in the *Railway Age* of March 26, was born on August 9, 1890, at Red Oak, Iowa. Mr. Tatem entered railroad service on April 29, 1913, with the Southern and served until 1918 as road and yard conductor and brakeman. He then became safety supervisor, holding that position until 1920, when he became night yardmaster at Winston Salem, N. C. In 1925 Mr. Tatem was appointed day yardmaster and in 1927, general yardmaster, at Winston Salem. He was appointed trainmaster at Richmond, Va., in 1934, terminal superintendent at Columbia, S. C., in 1935, and assistant superintendent at Columbia in 1937, the position he held at the time of his recent appointment as superintendent.

TRAFFIC

W. G. Findlay has been appointed foreign freight agent at Montreal, Que., for the Canadian Pacific, succeeding **A. J. Fleming,** who died recently.

C. E. Norris has been appointed division freight agent for the Alton and the Baltimore & Ohio, with headquarters at Peoria, Ill., succeeding **C. M. Teschemacher,** who died recently.

George W. Dobbin, general agent for the Pittsburgh & West Virginia at Chicago, has been appointed general agent at Baltimore, Md., succeeding **R. J. McMillen,** who has resigned.

J. D. Whitman, industrial agent for the Gulf, Colorado & Santa Fe at Galveston, Tex., has been appointed division freight agent at Dallas, Tex., and has been succeeded at Galveston by **H. A. Taylor.**

Charles H. Thompson, traveling freight and passenger agent for the Colorado & Southern and the Fort Worth & Denver City (units of the Chicago, Burlington & Quincy), with headquarters at Houston, Tex., has been appointed to the newly-created position of general agent at Portland, Ore.

J. A. Fitzgerald has been appointed division freight agent at Kansas City, Mo., on the Atchison, Topeka & Santa Fe, succeeding **Warren H. Turner,** whose promotion to assistant to the vice-president in charge of traffic at Chicago was reported in the *Railway Age* of March 5. **B. A. Everett** has been appointed division freight agent at Tulsa, Okla., to succeed K. F. Burnett, who has been transferred to Chicago to replace **E. M. Fogarty,** whose promotion to assistant general freight agent at Topeka, Kan., was also reported in the *Railway Age* of March 5.

Richard A. Ebe, general live stock agent of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been retired, at his own request, after nearly 55 years of service with this road. The duties heretofore performed by Mr. Ebe have been placed under the jurisdiction of **Frank T. Sturtevant,** general freight agent, Baltimore, Md. **J. E. Steele,** division freight agent, at Connellsville, Pa., has been transferred in the same capacity to Newark, Ohio, succeeding **C. D. Douglass,** who has retired after 46 years of service with the B. & O. **J. R. Brown,** division freight agent at Grafton, W. Va., has retired after 51 years of service and **G. A. Upton,** division freight agent, Garrett, Ind., has retired after 46 years of service. The division freight agencies at Grafton, Connellsville and Garrett have been abolished.

ENGINEERING AND SIGNALING

George W. Higgins, formerly in the water supply department of the Chicago-Petoskey division of the Pere Marquette, has been appointed supervisor of bridges and buildings on the same division, with headquarters at Grand Rapids, Mich., to succeed **John Robinson,** who has retired after 39 years service in the bridge and building department.

MECHANICAL

L. W. Goodrich, acting master mechanic at Chicago for the Atchison, Topeka & Santa Fe since July 20, 1937, has been appointed master mechanic at that point.

A. B. Colville, superintendent of shops at Hillyard, Wash., for the Great Northern, has been appointed superintendent of motive power at Spokane, Wash., succeeding **A. B. Ford.**

W. R. Hedeman, assistant to chief of motive power and equipment of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been appointed engineer of tests, with the same headquarters, succeeding **C. P. Van Gundy,** who has retired after 46 years of service.

Oliver C. Cromwell, assistant to chief of motive power and equipment of the Baltimore & Ohio, with headquarters at Baltimore, has retired after 58 years of active service. Mr. Cromwell was born in Baltimore on August 29, 1860, and entered the service of the Baltimore & Ohio as an apprentice draftsman on July 1, 1878. He was mechanical engineer from 1900 to 1918, when he became assistant to general superintendent of motive power and equipment. In February, 1921, he was appointed to the position from which he has now retired.

Edmund E. Chapman, engineer of tests of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., has been appointed mechanical assistant to the assistant to the vice president, with headquarters at Chicago, succeeding **J. P. Morris,** whose promotion to mechanical superintendent at Shopton, Iowa, was reported in the *Railway Age* of April 2. Mr. Chapman will continue to serve as engineer of tests. He was born on January 3, 1884, at Mankato, Kan., and was educated in the Concordia (Kan.) high school and at Purdue University, graduating from the course in mechanical engineering in 1907. After serving briefly with the Erie as a special apprentice, Mr. Chapman entered the service of the Santa Fe in December, 1909, as an assistant in the test department at Topeka. Following military service as captain and major in the ordnance department, he returned to the Santa Fe in June, 1919, as assistant engineer of tests, and became engineer of tests on March 1, 1921, holding this position until his recent appointment.

SPECIAL

Jesse E. Williams, signature officer in the president's department of the Pennsylvania, has retired from active duty under the pension provisions, effective April 1, after 53 years of continuous service with that road. Mr. Williams entered railroad service on April 1, 1885, as night telegraph operator at Phoenixville, Pa. On March 1, 1898, he became attached to the president's office, serving as telegraph operator, stenographer and clerk. On September 30, 1930, he was appointed signature officer and authorized to sign stocks, bonds and other important documents for the president. He was also made a notary public in Pennsylvania and foreign commissioner of deeds for New Jersey.

OBITUARY

Frederick L. Simmons, who retired as supervisor of industrial relations of the Pullman Company on October 1, 1935, died in Oak Park, Ill., on April 5.

J. Frank Shinn, who retired in 1936 as assistant to the passenger traffic manager of the Erie at Cleveland, Ohio, died on March 10 at Passaic, N. J.

J. B. Skeen, valuation engineer of the Coast lines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., died on March 29 following an operation.

John T. Broderick, former superintendent of the safety department of the Baltimore & Ohio, died on March 31 at his home in Baltimore, Md., in his 71st year. He was retired on February 1, 1927.

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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1938

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: 1938	1937
Akron, Canton & Youngstown	Feb.	171	$109,098	$35	$115,533	$22,431	$9,275	$11,553	$49,934	$102,110	88.4	$13,423	$538	—$13,888	$39,147
	2 mos.	171	227,992	85	239,584	43,744	26,406	23,039	100,722	213,279	89.0	26,305	206	—28,406	71,636
Alton	Feb.	957	781,277	201,210	1,140,612	118,353	202,804	46,378	508,417	949,266	83.2	191,346	91,690	—54,987	151,645
	2 mos.	957	1,635,762	425,542	2,392,690	244,189	392,276	95,277	1,073,429	1,956,039	81.8	436,651	234,272	—77,438	301,774
Atchison, Topeka & Santa Fe System	Feb.	13,512	7,886,978	1,242,031	10,053,515	1,485,451	3,123,112	482,660	4,501,368	9,976,449	99.2	77,066	—1,144,579	—1,261,162	1,140,730
	2 mos.	13,512	16,693,462	2,591,424	21,178,116	2,984,164	6,431,273	932,306	9,423,209	20,569,144	97.1	608,972	—1,899,183	—2,127,803	2,307,097
Atlanta & West Point	Feb.	93	78,452	24,673	122,917	17,743	25,091	8,538	59,883	122,184	99.4	733	—9,042	—22,706	2,968
	2 mos.	93	164,052	50,703	255,183	34,372	52,405	17,083	128,854	254,872	99.9	311	—19,401	—47,061	—6,117
Western of Alabama	Feb.	133	82,990	24,960	123,899	15,304	29,594	8,142	52,311	115,316	93.1	8,583	—4,774	—3,277	7,816
	2 mos.	133	171,185	51,480	255,379	30,386	60,156	15,750	109,316	236,098	92.5	19,281	—7,579	—5,900	485
Atlanta, Birmingham & Coast	Feb.	639	199,768	40,344	263,191	40,539	44,999	24,642	112,886	246,457	93.6	16,734	—7,808	—31,448	5,843
	2 mos.	639	404,098	76,355	532,369	84,867	97,158	49,155	230,941	510,089	95.8	22,280	—27,538	—66,366	10,640
Atlantic Coast Line	Feb.	5,105	2,717,472	1,182,032	4,345,121	385,153	714,959	177,324	1,606,736	3,105,463	71.5	1,239,658	764,658	566,364	1,013,051
	2 mos.	5,105	5,401,536	2,088,295	8,335,180	809,053	1,453,399	349,772	3,329,830	6,383,260	76.6	1,951,920	1,051,920	675,195	1,541,957
Charleston & Western Carolina	Feb.	343	166,406	827	171,376	30,311	37,390	8,768	66,713	149,061	87.0	22,315	2,315	—2,709	29,712
	2 mos.	343	343,376	1,798	353,514	55,355	75,049	16,772	137,371	297,226	84.1	56,288	14,288	4,372	60,545
Baltimore & Ohio	Feb.	6,446	7,690,074	740,317	9,059,598	1,110,356	2,488,244	386,187	4,298,109	8,820,295	97.4	239,303	—660,938	—920,817	1,799,373
	2 mos.	6,446	16,916,205	1,710,837	19,951,820	2,300,118	4,964,456	724,547	9,012,297	18,118,870	90.8	1,832,950	10,141	—623,916	3,820,422
Staten Island Rapid Transit	Feb.	24	47,962	60,026	114,765	8,605	19,546	1,015	80,734	120,130	104.7	—5,365	—34,545	—39,343	—25,433
	2 mos.	24	98,379	123,647	236,451	16,916	39,487	2,099	167,007	246,708	104.3	—10,257	—67,334	—77,532	—58,665
Bangor & Aroostook	Feb.	603	662,789	21,731	700,925	99,816	94,268	6,892	171,569	397,558	56.7	303,367	231,133	208,434	204,010
	2 mos.	603	1,391,436	42,138	1,467,652	203,090	190,204	12,654	351,969	811,113	55.3	656,539	505,236	460,473	381,119
Bessemer & Lake Erie	Feb.	225	242,092	640	252,318	39,166	210,896	11,708	121,403	415,665	164.7	—163,347	—196,236	—176,713	136,805
	2 mos.	225	533,566	1,386	553,416	85,557	485,950	24,347	256,636	920,091	166.3	—366,675	—437,523	—392,658	367,836
Boston & Maine	Feb.	1,960	1,987,212	574,520	2,961,961	443,566	494,722	62,396	1,430,924	2,580,157	87.1	381,804	76,580	—114,582	554,066
	2 mos.	1,960	4,149,581	1,208,850	6,211,563	943,072	967,785	128,443	2,996,793	5,354,259	86.2	857,304	237,988	—155,436	1,147,099
Burlington, Rock Island	Feb.	255	73,675	13,925	94,381	19,195	20,393	4,680	51,923	105,704	112.0	—11,323	—18,780	—31,637	—7,325
	2 mos.	255	159,543	33,868	208,403	39,120	38,415	9,953	108,751	216,510	103.9	—8,107	—22,928	—49,592	—30,587
Cambria & Indiana	Feb.	37	104,550	.....	104,647	5,029	44,026	420	10,750	65,411	62.50	39,236	16,773	69,597	91,926
	2 mos.	37	212,237	.....	212,429	10,459	89,640	844	22,162	135,738	63.90	76,691	27,903	158,685	179,538
Canadian Pacific Lines in Maine	Feb.	234	262,925	12,660	285,468	17,890	51,230	9,756	103,935	191,232	67.0	94,236	83,200	61,171	62,177
	2 mos.	234	564,162	27,091	612,773	57,787	103,086	19,856	218,854	417,028	68.1	195,745	173,295	122,889	129,066
Canadian Pacific Lines in Vermont	Feb.	85	36,019	8,197	53,827	8,792	21,780	4,336	56,301	96,683	179.6	—42,856	—49,549	—67,229	—44,639
	2 mos.	85	75,023	18,907	114,870	21,366	43,667	8,354	121,861	206,644	179.9	—91,774	—105,232	—144,221	—74,886
Central of Georgia	Feb.	1,926	893,747	117,768	1,169,054	160,999	225,258	57,241	550,417	1,077,767	92.2	91,287	—18,891	—46,221	120,473
	2 mos.	1,926	1,749,300	259,739	2,322,272	319,989	462,415	109,874	1,126,328	2,182,603	94.0	139,669	—81,937	—108,757	165,838
Central of New Jersey	Feb.	709	1,622,712	326,892	2,083,862	120,250	375,168	48,708	1,022,134	1,653,552	79.4	430,310	80,458	—77,776	47,440
	2 mos.	709	3,644,999	689,176	4,615,475	263,359	764,182	93,476	2,187,543	3,493,624	75.7	1,121,851	417,010	79,318	160,091
Central Vermont	Feb.	456	291,445	37,660	365,331	71,889	63,409	14,680	198,929	368,882	101.0	—3,551	—28,574	—59,291	46,941
	2 mos.	456	586,649	77,246	737,283	127,602	147,644	30,893	450,521	795,959	108.0	—58,676	—110,698	—179,257	63,003
Chesapeake & Ohio	Feb.	3,102	6,935,035	190,493	7,329,989	907,868	1,661,327	219,213	2,137,606	5,200,683	71.0	2,129,306	1,429,078	1,452,086	3,217,328
	2 mos.	3,102	14,965,678	474,915	15,895,324	1,836,209	3,409,007	410,047	4,455,412	10,707,132	67.4	5,188,192	3,399,487	3,496,545	5,525,276
Chicago & Eastern Illinois	Feb.	927	886,338	120,979	1,138,301	135,904	204,064	54,886	480,622	941,178	82.7	197,123	118,123	—19,630	125,508
	2 mos.	927	1,855,869	278,537	2,390,846	279,498	427,048	111,477	1,007,399	1,956,923	81.9	433,923	275,923	11,434	283,445
Chicago & Illinois Midland	Feb.	131	271,249	868	277,894	19,324	65,500	19,003	79,051	200,768	72.2	77,126	55,111	50,667	102,297
	2 mos.	131	574,424	1,831	588,405	42,742	134,162	42,395	170,295	426,523	72.5	161,882	114,758	109,087	209,378
Chicago & North Western	Feb.	8,391	4,083,173	768,910	5,493,860	753,241	1,483,249	178,257	2,811,413	5,512,538	100.3	—18,678	—675,330	—829,225	—618,145
	2 mos.	8,391	8,575,792	1,720,370	11,611,374	1,599,348	3,091,098	381,838	5,853,197	11,535,061	99.3	76,313	—1,252,565	—1,609,020	—959,834
Chicago, Burlington & Quincy	Feb.	8,970	4,888,050	627,829	6,236,740	635,348	1,390,803	235,168	2,715,085	5,253,155	84.2	983,585	261,208	—120,155	1,084,642
	2 mos.	8,970	10,286,778	1,374,807	13,158,771	1,368,343	2,886,772	476,504	5,650,523	10,982,410	83.5	2,176,361	709,549	—88,144	1,624,421
Chicago Great Western	Feb.	1,505	1,106,216	34,203	1,220,432	218,812	235,641	60,574	566,044	1,131,637	92.7	88,795	—2,972	—178,690	—77,589
	2 mos.	1,505	2,326,974	79,570	2,588,373	438,425	472,688	123,564	1,189,307	2,326,723	89.9	261,650	75,236	—285,961	—80,138
Chicago, Indianapolis & Louisville	Feb.	549	502,325	38,712	595,924	64,509	175,497	29,365	293,461	599,898	100.7	—3,974	—49,603	—145,882	56,352
	2 mos.	549	1,057,064	91,861	1,264,763	135,737	354,593	59,879	614,732	1,241,445	98.2	23,318	—70,409	—270,532	51,764

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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: 1938	1937
Chicago, Milwaukee, St. Paul & Pacific	Feb.	10,961	$5,572,337	$537,825	$6,771,539	$752,001	$1,488,536	$213,931	$3,096,318	$5,918,789	87.4	$852,750	$135,750	—$228,427	$361,092
	2 mos.	10,964	11,805,671	1,204,052	14,401,301	1,562,540	3,029,440	438,262	6,499,398	12,284,589	85.3	2,116,712	651,712	—126,016	950,156
Chicago, Rock Island & Pacific	Feb.	7,496	4,148,945	589,684	5,212,219	607,567	1,088,768	232,251	2,463,636	4,739,480	90.9	472,739	—14,947	—300,999	—26,722
	2 mos.	7,497	8,548,431	1,279,006	10,805,985	1,155,910	2,247,660	467,788	5,156,924	9,736,233	90.1	1,069,752	68,493	—455,413	—176,717
Chicago, Rock Island & Gulf	Feb.	626	238,327	30,816	355,505	24,296	34,116	18,715	145,948	247,656	69.7	107,849	83,575	14	—21,572
	2 mos.	626	494,365	64,541	749,075	83,948	69,351	38,092	302,394	545,205	72.8	203,870	154,632	—4,114	—6,227
Chicago, St. Paul, Minneapolis & Omaha	Feb.	1,648	965,090	105,554	1,147,885	98,239	252,890	39,039	643,459	1,100,154	95.8	47,731	—58,723	—143,125	—243,273
	2 mos.	1,648	2,080,102	234,179	2,477,859	205,346	514,854	80,383	1,356,003	2,293,271	92.6	184,588	—32,726	—233,074	—435,467
Clinchfield Railroad	Feb.	308	462,047	3,173	470,196	36,306	109,872	20,282	105,583	287,201	61.1	182,995	132,900	150,542	250,843
	2 mos.	308	955,388	7,432	973,325	65,582	221,784	39,254	217,653	575,593	59.1	397,732	297,224	343,639	533,906
Colorado & Southern	Feb.	797	372,565	30,248	450,775	34,905	121,566	14,002	196,937	394,297	87.5	56,478	—19,716	—40,301	6,928
	2 mos.	797	749,762	69,157	919,257	70,603	253,894	29,772	418,697	829,188	90.2	90,069	—63,632	—100,052	43,572
Fort Worth & Denver City	Feb.	902	455,767	46,686	492,364	45,352	98,849	18,361	178,440	374,261	76.0	118,103	79,196	37,297	76,270
	2 mos.	902	989,197	123,912	1,076,603	92,350	211,347	37,206	374,776	784,058	72.8	292,545	214,205	132,171	131,613
Columbus & Greenville	Feb.	168	89,359	6,254	101,687	19,071	18,119	4,744	36,885	88,584	87.1	13,103	6,205	5,231	34,027
	2 mos.	168	168,159	15,444	196,266	38,844	34,827	9,043	77,566	181,220	92.3	15,046	1,819	648	35,039
Delaware & Hudson	Feb.	831	1,365,412	89,249	1,519,730	134,253	277,405	44,542	744,711	1,309,401	86.2	210,329	58,280	62,897	171,818
	2 mos.	831	2,981,078	201,995	3,322,947	335,520	718,587	88,149	1,547,391	2,920,798	87.9	402,149	84,548	86,596	457,644
Delaware, Lackawanna & Western	Feb.	986	2,244,341	498,685	3,128,165	169,137	571,842	112,817	1,712,762	2,699,596	86.3	428,569	23,569	4,616	283,109
	2 mos.	986	4,789,291	1,110,372	6,690,615	350,347	1,236,573	227,154	3,624,314	5,695,636	85.1	994,979	154,979	100,811	721,427
Denver & Rio Grande Western	Feb.	2,570	1,298,243	76,314	1,456,353	131,005	471,039	60,330	626,671	1,369,782	94.1	86,571	—138,666	—185,669	54,772
	2 mos.	2,570	2,838,949	179,615	3,193,245	258,877	955,502	124,987	1,363,892	2,865,500	89.7	327,745	—119,200	—213,597	149,848
Denver & Salt Lake	Feb.	232	155,063	9,510	174,135	15,431	38,370	2,819	55,296	121,950	70.0	52,185	23,656	67,731	150,917
	2 mos.	232	324,560	17,579	361,527	34,964	88,364	5,886	117,549	270,566	74.8	90,961	33,008	118,092	279,362
Detroit & Mackinac	Feb.	242	38,774	2,339	44,651	7,160	11,987	1,096	23,249	46,673	104.5	—2,022	—5,050	—8,231	3,220
	2 mos.	242	78,463	6,189	92,985	15,329	22,064	2,186	47,918	93,912	101.0	—927	—7,034	—13,084	5,047
Detroit & Toledo Shore Line	Feb.	50	231,990	.....	232,430	18,116	24,530	9,508	59,945	119,543	51.4	112,887	87,196	44,277	149,013
	2 mos.	50	500,569	.....	501,587	36,581	48,300	19,028	131,536	250,231	49.9	251,356	196,459	107,600	253,999
Detroit, Toledo & Ironton	Feb.	472	400,953	146	416,049	46,435	82,634	11,364	124,659	283,765	68.2	132,284	93,281	74,769	300,747
	2 mos.	472	946,610	360	979,368	103,319	166,949	23,019	264,457	597,035	61.0	382,333	287,367	240,034	614,592
Duluth, Missabe & Iron Range	Feb.	540	90,272	1,162	106,799	108,045	219,941	4,016	156,178	521,674	488.5	—414,875	—506,919	—503,787	—664,585
	2 mos.	540	192,769	2,547	230,729	226,241	444,241	8,661	311,828	1,059,484	459.2	—828,755	—1,014,112	—1,018,283	—1,314,277
Duluth, Winnipeg & Pacific	Feb.	179	93,695	1,210	97,785	17,673	19,191	2,290	48,052	90,962	93.0	6,823	—1,143	—22,273	3,247
	2 mos.	179	202,067	2,494	210,520	35,627	39,229	4,490	100,314	187,158	88.9	23,362	6,351	—32,462	—4,844
Elgin, Joliet & Eastern	Feb.	435	677,113	.....	746,309	116,370	212,179	14,844	399,583	780,644	104.6	—34,335	—112,023	—119,185	333,207
	2 mos.	435	1,551,572	2	1,700,825	209,284	435,944	30,274	842,000	1,593,845	93.7	106,980	—70,884	—91,939	601,448
Erie	Feb.	2,275	4,005,213	363,776	4,724,008	491,391	1,231,466	168,239	2,258,547	4,409,540	93.3	314,468	—236,304	—504,008	1,113,310
	2 mos.	2,275	8,694,996	789,214	10,230,117	874,447	2,362,934	338,396	4,742,459	8,832,882	86.3	1,397,235	293,777	—286,074	2,301,323
New Jersey & New York	Feb.	46	11,726	39,485	53,157	3,769	11,780	504	44,120	61,091	114.9	—7,934	—15,162	—28,367	—29,254
	2 mos.	46	26,072	84,431	114,396	8,033	24,978	958	93,692	130,110	113.7	—15,714	—30,358	—58,903	—60,043
New York, Susquehanna & Western	Feb.	143	198,765	21,288	229,590	17,032	25,238	3,221	102,337	161,923	70.5	67,667	35,901	—7,795	26,943
	2 mos.	143	464,388	44,898	534,724	29,532	53,104	6,660	220,897	338,777	63.4	195,947	131,926	45,091	68,456
Florida East Coast	Feb.	685	638,557	546,950	1,300,882	70,794	139,898	23,661	371,220	679,990	52.3	620,892	537,810	484,246	419,948
	2 mos.	685	1,182,378	919,655	2,323,532	148,387	293,277	49,224	732,228	1,378,553	59.3	944,979	779,084	683,590	709,076
Georgia Railroad	Feb.	329	228,122	8,840	257,410	34,319	44,171	18,753	120,468	232,244	90.2	25,166	10,210	21,050	44,421
	2 mos.	329	450,373	21,043	512,810	63,440	95,282	38,361	256,103	483,012	94.2	29,798	—877	21,538	84,777
Georgia & Florida	Feb.	408	73,194	1,829	78,207	20,063	17,243	8,777	34,123	85,900	109.8	—7,693	—15,333	—20,021	2,078
	2 mos.	408	148,520	3,601	158,595	41,535	34,555	16,946	69,009	173,672	109.5	—15,077	—30,600	—32,932	7,687
Grand Trunk Western	Feb.	1,032	1,110,833	74,188	1,274,625	179,850	314,229	43,328	709,075	1,327,421	104.1	—52,796	—175,969	—209,735	179,606
	2 mos.	1,032	2,315,043	172,915	2,695,384	341,772	662,172	84,660	1,485,093	2,728,871	101.2	—33,487	—285,503	—406,741	217,046
Canadian National Lines in New England	Feb.	172	101,084	4,701	112,520	21,948	12,356	2,652	57,530	98,728	87.7	13,792	—1,514	—30,606	—47,466
	2 mos.	172	182,640	11,406	207,724	47,720	37,681	5,172	118,744	219,337	105.6	—11,613	—42,224	—101,434	—92,408
Great Northern	Feb.	8,071	3,409,652	300,866	4,129,020	486,268	1,047,343	173,806	2,076,973	4,030,921	97.6	98,099	—485,622	—630,069	—218,099
	2 mos.	8,071	7,195,745	661,092	8,714,023	990,399	2,043,411	365,297	4,340,718	8,255,379	94.7	458,644	—827,974	—1,126,652	—33,389

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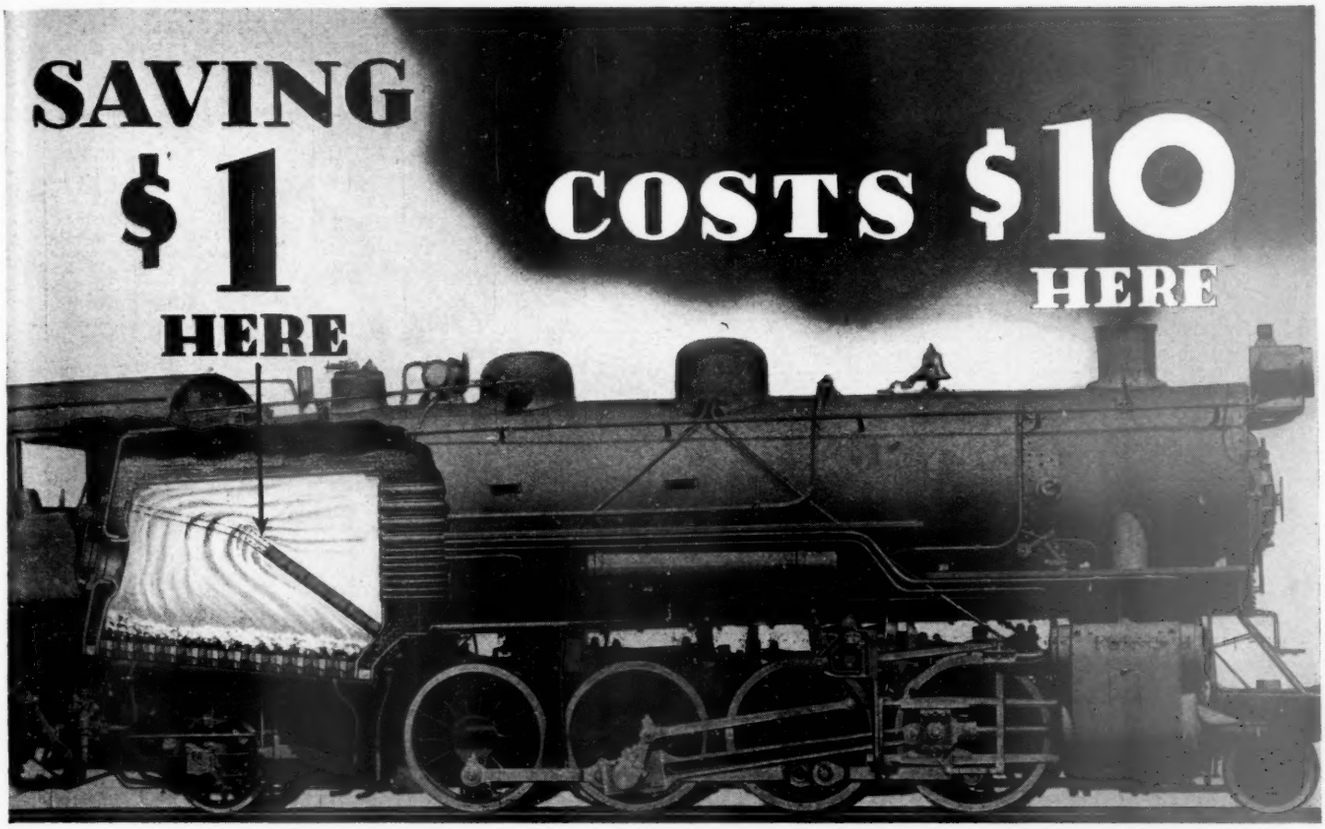

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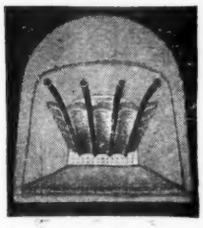
No one questions locomotive Arch economy. The Arch has been so thoroughly proved as a fuel saver by railroad after railroad for years past.

In the urge for money saving don't let the desire to save a few dollars in Arch brick expense by skimping on the Arch blind you to the fact that every dollar thus "saved", boosts the fuel bill ten dollars.

The surest way to the lowest operating cost is not in crippling proved economy devices but in making full use of them. This means complete Arches, with every brick in place, for each locomotive that leaves the roundhouse.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED
60 EAST 42nd STREET, NEW YORK, N. Y.
Locomotive Combustion Specialists

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1938	Net railway operating income 1937
Green Bay & Western	Feb.	234	$100,261	$443	$104,674	$16,952	$15,054	$6,754	$44,715	$87,636	83.7	$17,038	$7,107	$729	$18,344
	2 mos.	234	214,742	1,164	224,737	34,058	32,132	13,732	91,745	179,755	79.9	44,982	24,972	16,136	28,648
Gulf & Ship Island	Feb.	259	72,272	5,427	89,041	17,986	13,650	2,891	53,181	92,523	103.9	—3,482	—20,692	—30,243	—15,938
	2 mos.	259	144,797	13,225	182,048	35,488	29,800	5,974	109,831	191,473	105.2	—9,425	—43,905	—62,509	—42,075
Gulf, Mobile & Northern	Feb.	936	468,149	20,122	509,637	61,051	94,070	40,369	157,310	387,822	76.1	121,815	72,815	17,574	89,408
	2 mos.	936	969,377	43,280	1,060,175	133,161	171,901	82,958	337,576	799,145	75.4	261,030	163,030	51,738	151,376
Illinois Central	Feb.	4,951	5,600,741	784,589	6,871,590	641,519	1,366,358	181,625	2,840,338	5,357,267	78.0	1,514,323	846,748	778,420	396,355
	2 mos.	4,951	11,946,254	1,674,736	14,654,542	1,293,134	2,807,009	366,704	6,076,654	11,218,538	76.6	3,436,004	2,065,808	1,870,389	642,939
Yazoo & Mississippi Valley	Feb.	1,619	968,857	58,161	1,093,802	102,771	154,214	30,226	445,690	779,235	71.2	314,567	172,943	99,098	35,070
	2 mos.	1,619	2,013,597	136,665	2,289,074	194,759	313,251	61,315	946,200	1,611,744	70.4	677,330	392,426	246,096	178,892
Illinois Central System	Feb.	6,570	6,569,598	842,750	7,965,392	744,290	1,520,572	211,851	3,286,028	6,136,502	77.0	1,828,890	1,017,628	887,118	440,425
	2 mos.	6,570	13,959,851	1,811,401	16,943,616	1,487,893	3,120,260	428,019	7,022,854	12,830,282	75.7	4,113,334	2,454,108	2,135,285	841,131
Illinois Terminal	Feb.	496	276,889	57,268	366,104	41,675	62,587	15,349	153,284	290,144	79.25	75,960	17,054	4,038	137,823
	2 mos.	496	611,047	119,068	800,398	82,103	131,221	32,540	322,066	602,700	75.30	197,698	94,282	65,252	248,781
Kansas City Southern	Feb.	879	953,283	14,423	1,087,654	109,703	149,464	48,634	322,496	692,038	63.6	395,616	289,616	231,463	196,128
	2 mos.	879	1,951,195	31,021	2,214,064	215,126	293,821	99,822	675,166	1,412,453	63.8	801,611	597,611	486,338	387,792
Kansas, Oklahoma & Gulf	Feb.	327	175,403	441	185,141	11,669	18,540	8,899	42,979	91,336	49.3	93,805	75,923	60,689	35,340
	2 mos.	327	365,430	957	378,344	22,808	33,669	18,228	88,328	182,114	48.1	196,230	160,523	129,890	106,719
Lake Superior & Ishpeming	Feb.	156	32,993	60	34,200	22,368	30,005	573	23,286	82,580	241.5	—48,380	—69,375	—69,061	—52,783
	2 mos.	156	65,661	133	68,340	45,551	60,338	1,389	45,943	166,058	243.0	—97,718	—139,641	—139,542	—102,617
Lehigh & Hudson River	Feb.	96	104,514	69	105,147	8,947	32,098	4,152	46,901	99,407	94.5	5,740	—5,851	—18,780	10,456
	2 mos.	96	210,624	170	211,963	17,937	47,017	8,111	89,973	177,238	83.6	34,725	11,147	—15,044	25,167
Lehigh & New England	Feb.	215	219,576	.....	221,018	28,068	62,611	6,907	92,286	203,463	92.1	17,555	4,880	17,771	5,827
	2 mos.	215	471,851	.....	475,709	58,101	128,023	13,722	195,289	423,615	89.0	52,094	23,206	51,923	38,440
Lehigh Valley	Feb.	1,308	2,660,663	174,313	3,031,262	169,481	618,371	111,861	1,510,921	2,543,786	83.9	487,476	215,694	10,795	386,841
	2 mos.	1,308	5,879,744	391,005	6,696,496	373,816	1,263,257	222,717	3,263,479	5,397,226	80.6	1,299,270	735,542	286,941	785,264
Louisiana & Arkansas	Feb.	606	442,518	8,745	467,640	58,220	72,737	30,925	127,090	307,670	65.8	159,970	119,169	86,910	82,579
	2 mos.	606	889,673	20,414	945,228	117,642	149,021	64,705	265,014	636,990	67.4	308,238	227,916	173,467	164,515
Louisiana, Arkansas & Texas	Feb.	240	88,687	90	92,340	19,812	14,352	5,214	42,060	86,162	93.3	6,178	1,240	—13,367	1,995
	2 mos.	240	172,344	160	181,143	38,068	27,517	9,979	86,453	172,150	95.0	8,993	—1,271	—32,658	—6,105
Louisville & Nashville	Feb.	4,938	4,832,417	547,438	5,778,511	700,638	1,413,683	211,041	2,347,405	4,941,729	85.5	836,782	242,908	241,186	758,238
	2 mos.	4,938	10,326,003	1,179,384	12,357,110	1,456,838	2,937,758	429,404	4,996,137	10,390,709	84.1	1,966,401	794,438	800,235	1,665,371
Maine Central	Feb.	1,010	819,929	67,435	948,824	141,501	200,315	14,536	374,517	763,709	71.0	185,115	108,752	43,761	165,636
	2 mos.	1,010	1,727,315	148,577	2,021,339	322,380	362,028	25,659	800,063	1,578,940	78.1	442,399	328,561	194,880	330,493
Midland Valley	Feb.	352	92,196	9	94,046	9,585	13,807	2,732	28,004	60,362	64.2	33,684	21,581	15,059	31,643
	2 mos.	352	195,368	12	199,762	19,728	26,797	5,388	59,938	124,438	62.3	75,324	51,249	36,320	92,340
Minneapolis & St. Louis	Feb.	1,528	560,928	7,255	602,221	64,899	105,133	41,259	268,986	513,872	85.3	88,349	46,339	5,736	—94,379
	2 mos.	1,528	1,180,071	16,948	1,262,856	133,042	241,699	86,459	567,129	1,101,726	87.2	161,130	70,004	2,337	—145,068
Minneapolis, St. Paul & Sault Ste. Marie	Feb.	4,301	1,290,345	64,383	1,488,305	242,694	378,776	57,766	882,379	1,644,496	110.5	—156,191	—316,073	—422,208	—259,651
	2 mos.	4,301	2,780,111	150,870	3,233,111	491,129	753,818	119,729	1,855,628	3,408,758	105.4	—175,647	—535,755	—763,651	—454,937
Duluth, South Shore & Atlantic	Feb.	549	103,474	9,858	125,964	41,482	34,317	4,429	77,071	164,541	130.6	—38,577	—51,677	—58,060	—8,596
	2 mos.	549	209,455	23,940	258,513	75,271	69,961	9,130	156,922	325,481	125.9	—66,968	—94,112	—107,465	—13,089
Spokane International	Feb.	164	35,156	1,061	42,349	7,775	7,629	2,056	20,205	42,124	99.5	225	—4,386	—6,137	3,337
	2 mos.	164	70,597	2,432	84,445	15,868	14,666	4,256	41,864	86,104	102.0	—1,659	—11,500	—14,837	820
Mississippi Central	Feb.	150	58,678	1,546	62,074	10,522	10,803	7,395	21,162	54,694	88.1	7,380	2,674	—2,600	544
	2 mos.	150	114,605	3,633	122,089	21,821	20,515	14,861	45,261	112,245	91.9	9,844	351	—9,808	—621
Missouri & Arkansas	Feb.	365	72,974	1,211	79,305	23,386	15,375	5,572	30,427	79,273	100.0	32	—4,027	—12,760	—6,813
	2 mos.	365	159,988	2,814	173,167	42,929	27,554	11,121	64,535	154,678	89.3	18,489	10,335	—5,556	—19,576
Missouri-Illinois	Feb.	193	71,956	365	73,954	11,785	12,032	2,920	29,172	60,873	82.3	13,081	6,690	—3,074	20,424
	2 mos.	193	154,926	847	158,917	25,088	26,657	5,866	62,589	130,481	82.1	28,436	15,533	—6,003	29,153
Missouri-Kansas-Texas Lines	Feb.	3,294	1,588,283	152,869	1,941,839	308,179	350,935	110,219	900,981	1,798,391	92.6	143,448	9,330	—166,311	122,911
	2 mos.	3,294	3,483,436	339,194	4,239,811	604,650	723,941	225,705	1,866,329	3,684,837	86.9	554,974	272,920	—87,772	357,719
Missouri Pacific	Feb.	7,175	5,018,466	417,545	5,988,618	696,904	1,313,542	241,561	2,474,575	5,003,358	83.5	985,260	499,435	100,787	917,244
	2 mos.	7,175	10,489,307	876,289	12,515,709	1,404,457	2,543,784	479,773	5,296,663	10,288,219	82.2	2,227,490	1,249,402	433,816	1,660,260

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The *Ideal* Boiler Feed

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❶ Low in first cost.

❷ Low in maintenance cost, as there are no constantly moving parts.

❸ Easy to operate, as it is automatic in its changeover from live steam operation to exhaust steam operation.

❹ Stable in operation, as it automatically admits the maximum amount of exhaust steam that the suction water is capable of condensing. It operates satisfactorily with boiler pressures up to 300 lb. and suction water temperatures up to 105 deg. F.

❺ Reduces the fuel and water consumption from 8%-12%.

Specify it for your new power. More than 20,000 exhaust steam injectors have been applied to locomotives throughout the world.

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60 East 42nd Street, NEW YORK 122 S. Michigan Avenue, CHICAGO
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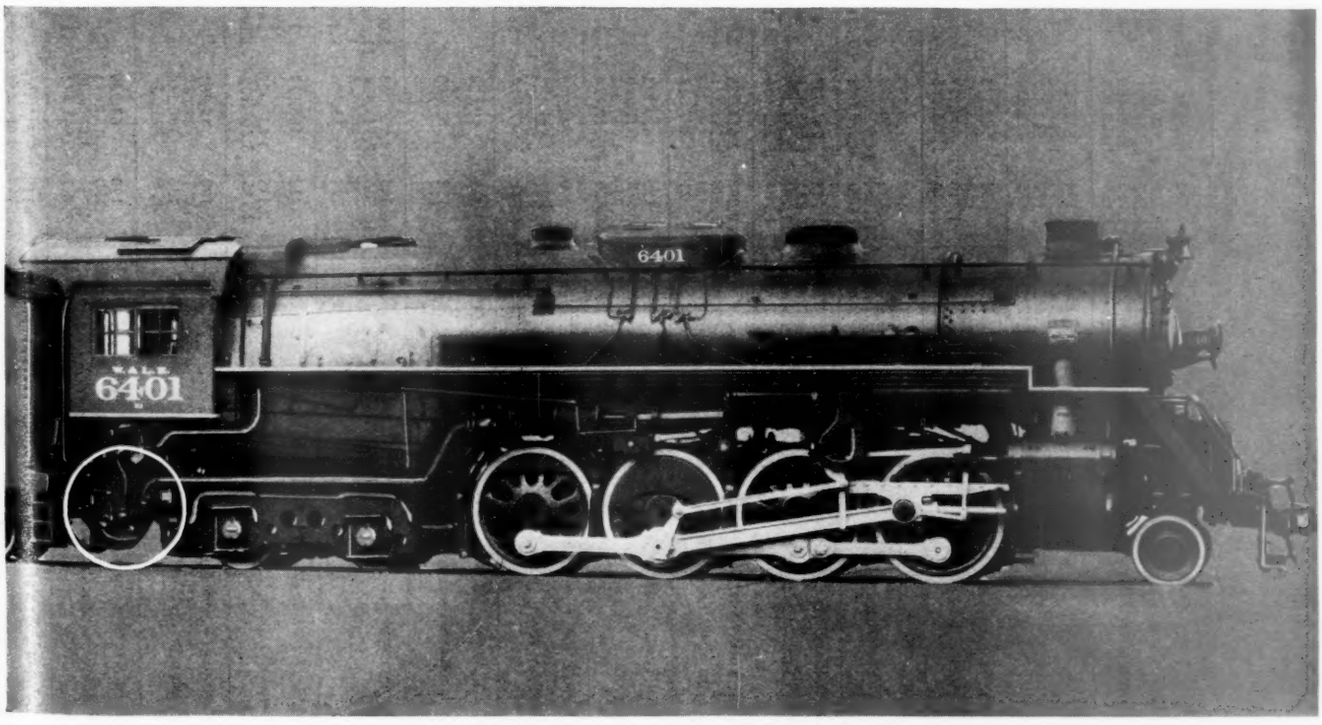
Superheaters • Exhaust Steam Injectors • Feed Water Heaters • American Throttles • Pyrometers • Steam Dryers

The Wheeling & Lake Erie Railway have ten of these locomotives, which are all equipped with Elesco Exhaust Steam Injectors.



REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1938	1937
Gulf Coast Lines & Subsidiaries	Feb.	1,767	$1,359,001	$39,582	$1,449,185	$162,665	$183,307	$46,148	$426,528	$864,233	59.6	$584,952	$513,724	$357,607	$652,025
	2 mos.	1,767	2,785,791	85,668	2,983,132	347,768	374,123	95,559	897,245	1,809,767	60.7	1,173,365	1,028,501	712,466	1,106,704
International Great Northern	Feb.	1,155	789,480	87,450	995,741	141,476	195,894	32,283	435,187	859,485	86.32	136,256	76,750	—22,826	—15,047
	2 mos.	1,155	1,602,128	180,520	2,007,797	283,826	390,351	65,306	907,942	1,758,115	87.56	249,682	128,359	—88,770	—32,349
Mobile & Ohio	Feb.	1,194	881,727	23,096	972,329	112,854	182,818	43,529	419,357	799,464	82.2	172,865	112,420	33,997	36,180
	2 mos.	1,194	1,766,566	54,198	1,949,740	206,358	350,752	86,385	827,108	1,556,184	79.8	393,556	272,155	112,217	50,625
Monongahela	Feb.	172	212,377	620	214,488	20,451	18,125	452	64,392	106,598	49.7	107,890	77,455	10,738	124,189
	2 mos.	172	432,654	1,346	437,696	48,105	41,615	983	133,091	230,077	52.6	207,619	146,382	7,819	269,023
Montour	Feb.	56	103,135	.....	105,092	7,693	36,036	1,090	35,651	86,859	82.7	18,233	3,676	30,040	52,542
	2 mos.	56	233,604	.....	237,324	15,394	73,164	2,079	78,761	182,490	76.9	54,834	21,486	76,015	107,392
Nashville, Chattanooga & St. Louis	Feb.	1,116	808,227	103,114	1,024,374	137,583	185,812	73,444	452,397	908,802	88.7	115,572	38,221	19,938	176,343
	2 mos.	1,116	1,635,585	230,205	2,122,521	268,750	376,917	142,907	928,963	1,838,627	86.6	283,894	127,205	86,145	202,820
Nevada Northern	Feb.	166	29,759	1,247	36,101	8,424	2,761	1,543	9,857	27,667	76.7	8,434	1,057	4,590	16,430
	2 mos.	166	66,622	2,537	79,402	16,945	6,777	2,422	20,022	56,064	70.6	23,338	8,091	14,949	31,583
New York Central	Feb.	11,080	14,602,555	4,435,144	21,469,280	2,401,872	4,837,507	530,709	9,983,026	19,013,123	88.6	2,456,157	—450,851	—1,588,789	3,035,759
	2 mos.	11,080	30,375,602	10,321,460	45,855,752	4,754,309	9,797,504	1,086,396	21,161,953	39,457,603	86.0	6,398,149	522,955	—1,761,825	6,899,462
Pittsburgh & Lake Erie	Feb.	233	745,467	43,727	831,768	90,520	343,345	26,537	406,041	943,214	113.4	—111,446	—225,908	—49,272	357,586
	2 mos.	233	1,545,621	96,933	1,729,745	169,025	726,035	56,851	894,952	2,009,322	116.2	—279,577	—496,172	—121,823	697,911
New York, Chicago & St. Louis	Feb.	1,704	2,541,105	53,954	2,684,274	300,528	441,927	115,195	1,110,414	2,077,396	77.4	606,878	400,691	145,263	800,066
	2 mos.	1,704	5,211,600	143,917	5,550,392	608,168	952,169	233,626	2,326,825	4,350,363	78.4	1,200,029	780,316	262,701	1,504,841
New York, New Haven & Hartford	Feb.	2,208	2,676,935	2,034,500	5,281,794	595,326	974,332	110,531	2,419,486	4,466,638	84.6	815,156	295,156	—247,673	595,529
	2 mos.	2,028	6,533,371	4,352,864	11,093,645	1,332,841	2,019,824	217,634	5,055,151	9,388,026	84.6	1,705,619	665,619	—421,336	1,293,643
New York Connecting	Feb.	21	133,263	.....	138,070	12,115	8,342	.....	29,494	51,186	37.1	86,884	49,247	24,687	108,533
	2 mos.	21	287,817	.....	297,159	26,642	32,685	.....	63,818	125,727	42.3	171,432	96,158	51,698	272,369
New York, Ontario & Western	Feb.	576	433,245	7,277	483,111	57,384	134,894	12,670	261,834	494,451	102.3	—11,340	—64,583	—92,175	4,614
	2 mos.	576	921,990	17,900	1,035,356	127,998	251,682	24,367	547,934	1,009,777	97.5	25,579	—80,996	—138,097	—13,222
Norfolk & Western	Feb.	2,200	4,940,246	121,440	5,221,866	671,412	1,220,506	148,693	1,507,065	3,739,149	71.6	1,482,717	570,894	697,379	2,478,793
	2 mos.	2,200	10,240,490	313,160	10,898,895	1,370,089	2,561,413	283,566	3,152,272	7,752,828	71.1	3,146,067	1,132,011	1,457,387	4,737,074
Norfolk Southern	Feb.	809	282,279	2,972	297,833	57,806	51,917	23,210	123,957	279,882	94.0	17,951	—13,761	—24,699	5,996
	2 mos.	809	541,164	8,073	582,412	119,804	104,421	46,854	256,876	579,345	99.5	3,067	—63,261	—83,534	—22,029
Northern Pacific	Feb.	6,721	2,891,522	250,734	3,486,662	368,664	957,357	159,789	1,690,759	3,436,399	98.6	50,263	—515,093	—258,062	66,273
	2 mos.	6,721	5,947,514	583,762	7,248,014	797,068	2,022,524	312,921	3,606,706	7,295,162	100.7	—47,148	—1,187,049	—559,437	463,637
Northwestern Pacific	Feb.	352	79,024	36,191	132,863	71,209	46,320	3,727	124,266	257,256	193.6	—124,393	—142,407	—150,789	—14,573
	2 mos.	352	219,507	85,969	346,730	146,415	100,758	8,423	292,043	571,650	164.9	—224,920	—262,292	—282,192	—47,462
Oklahoma City-Ada-Atoka	Feb.	132	33,920	337	35,859	7,177	1,410	787	11,019	22,178	61.8	13,681	11,165	5,472	—3,771
	2 mos.	132	72,657	724	76,998	13,394	3,148	1,715	21,929	43,882	57.0	33,116	27,731	16,795	3,693
Pennsylvania	Feb.	10,306	18,089,063	5,000,425	25,519,900	2,737,982	4,913,068	656,978	10,930,291	20,508,332	80.4	5,011,568	2,322,460	1,597,564	5,335,883
	2 mos.	10,306	37,543,564	11,283,974	53,985,522	5,628,707	10,841,906	1,323,957	23,069,611	43,500,006	80.6	10,485,516	5,038,857	3,656,751	10,548,895
Long Island	Feb.	394	394,746	1,069,663	1,534,720	164,078	292,072	7,803	922,515	1,418,426	92.4	116,294	—62,660	—205,702	—176,331
	2 mos.	394	835,836	2,298,993	3,279,247	333,390	614,044	15,099	1,898,102	2,930,333	89.4	348,914	—12,346	—269,942	—360,928
Pennsylvania-Reading Seashore Lines	Feb.	412	186,579	104,108	309,467	68,902	65,906	6,282	250,119	407,335	131.6	—97,868	—166,130	—213,281	—210,614
	2 mos.	412	381,392	198,093	614,780	138,714	138,488	12,998	512,026	835,162	135.8	—220,382	—357,714	—462,595	—432,707
Pere Marquette	Feb.	2,115	1,635,627	66,240	1,777,765	286,477	504,783	59,834	828,824	1,773,934	99.8	3,831	—148,646	—160,815	445,976
	2 mos.	2,115	3,367,139	160,106	3,699,026	578,549	986,370	121,294	1,743,402	3,623,326	98.0	75,700	—229,502	—373,218	486,667
Pittsburg & Shawmut	Feb.	100	45,264	364	46,285	15,244	19,795	1,649	16,990	58,906	127.2	—12,621	—13,497	—12,301	7,234
	2 mos.	100	88,227	779	90,402	29,880	35,833	3,427	35,861	115,213	127.4	—24,811	—27,760	—23,413	11,751
Pittsburgh & West Virginia	Feb.	136	186,144	.....	203,521	27,955	50,549	16,420	56,039	171,745	84.4	31,776	28,057	42,620	127,556
	2 mos.	136	393,959	.....	428,200	58,935	98,267	32,684	117,036	350,130	81.8	78,070	51,108	91,530	229,837
Pittsburg, Shawmut & Northern	Feb.	190	69,939	.....	70,678	12,486	13,473	1,291	27,102	60,580	85.7	10,098	4,945	—5,929	7,030
	2 mos.	190	154,854	1	156,833	24,545	28,198	2,386	61,729	129,568	82.6	27,265	16,637	—7,098	8,652
Reading	Feb.	1,452	3,067,320	256,183	3,505,056	238,033	827,163	76,717	1,721,958	3,012,433	85.9	492,623	199,011	256,577	1,091,411
	2 mos.	1,452	6,645,592	555,166	7,573,759	466,558	1,712,148	150,188	3,583,626	6,210,527	82.0	1,363,232	799,256	891,888	2,159,255
Richmond, Fredericksburg & Potomac	Feb.	118	317,490	267,736	685,966	61,965	133,655	9,303	298,175	556,664	81.2	129,302	80,157	25,147	109,455
	2 mos.	118	650,851	555,812	1,395,832	125,325	273,801	19,901	613,932	1,135,870	81.4	259,962	160,404	58,241	242,508

Continued on next left-hand page

On the New York Central

WHEN it came to motive power for the new deluxe streamlined 20th Century Limited, the New York Central demonstrated their implicit confidence in steam by again selecting the reliable time-tested, service-proved Hudson type locomotive. And why not?—For twelve years this fast passenger locomotive, hauling all the famous trains of the New York Central, has been making most exacting schedules with sunrise certainty. Now, with this long continued success with steam, 50 more improved Hudsons, ten of which are attractively streamlined for the Century, are being delivered, raising the total number of Hudsons on the Central to 275.

The construction of these 275 engines brought continued improvements in both proportions and mechanical details making each successive class of Hudsons more powerful, efficient and serviceable than the one before. These new engines develop more than 4,700 cylinder horsepower at 75 miles per hour. At 80 miles per hour they produce a drawbar pull of 17,500 pounds or 30 per cent more than the pull exerted by previous Hudsons at the same speed. Most important of all, this outstanding performance is delivered at a relatively low first cost.

Steam is still supreme on the New York Central.

AMERICAN LOCOMOTIVE COMPANY

30 CHURCH STREET NEW YORK N.Y.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY AND TWO MONTHS OF CALENDAR YEAR 1938—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1938	1937
Rutland	Feb.	407	$121,972	$28,278	$197,914	$34,129	$59,754	$10,987	$132,929	$251,420	127.0	—$53,506	—$81,711	—$82,478	$3,990
	2 mos.	407	260,554	63,819	423,003	72,028	124,200	21,964	282,726	534,209	126.3	—111,206	—169,229	—170,751	—6,292
St. Louis-San Francisco	Feb.	4,885	2,501,202	252,421	3,034,771	536,037	809,262	117,101	1,377,750	3,047,461	100.4	—12,690	—362,410	—391,734	355,383
	2 mos.	4,885	5,276,580	556,048	6,424,677	1,121,444	1,695,535	234,293	2,900,976	6,349,962	98.8	74,715	—645,777	—675,362	648,309
St. Louis, San Francisco & Texas	Feb.	266	107,818	426	112,703	25,010	13,641	7,667	53,834	106,398	94.4	6,305	—1,910	—31,205	—35,245
	2 mos.	266	211,118	1,032	222,504	49,319	28,507	15,580	112,773	218,938	98.4	3,566	—13,039	—75,152	—98,910
St. Louis Southwestern Lines	Feb.	1,706	1,343,375	18,850	1,421,733	188,678	189,133	79,882	560,285	1,086,342	76.4	335,391	228,828	76,283	119,841
	2 mos.	1,706	2,746,203	44,490	2,911,833	370,367	430,300	162,784	1,160,788	2,269,603	77.9	642,230	424,783	109,411	266,701
Seaboard Air Line	Feb.	4,318	2,548,349	637,215	3,560,908	423,136	680,293	182,047	1,359,061	2,862,442	80.4	698,466	358,466	208,892	499,848
	2 mos.	4,318	5,127,788	1,331,332	7,180,580	858,438	1,397,717	364,901	2,808,386	5,874,825	81.8	1,305,755	625,755	310,403	1,066,530
Southern Railway	Feb.	6,611	5,438,749	628,989	6,610,130	889,163	1,277,750	159,869	2,664,700	5,309,183	80.3	1,300,947	673,156	309,672	1,835,853
	2 mos.	6,611	10,927,187	1,501,946	13,575,846	1,816,513	2,599,094	319,196	5,590,426	10,981,483	80.9	2,594,363	1,308,907	588,095	3,185,809
Alabama Great Southern	Feb.	315	384,861	36,730	454,485	82,684	124,716	12,411	165,948	408,972	90.0	45,513	3,385	59,476	137,791
	2 mos.	315	738,432	92,710	902,420	165,989	251,815	26,481	338,645	829,671	91.9	72,749	—29,029	87,729	194,688
Cincinnati, New Orleans & Texas Pacific	Feb.	337	912,987	122,737	1,107,686	166,701	265,455	26,707	311,851	826,344	74.6	281,342	184,485	216,161	319,518
	2 mos.	337	1,811,972	289,400	2,252,396	329,115	552,291	54,753	656,239	1,707,995	75.8	544,401	325,607	447,511	537,017
Georgia Southern & Florida	Feb.	398	94,174	71,498	187,668	33,235	32,928	1,760	82,016	159,574	85.0	28,094	10,950	6,204	34,856
	2 mos.	398	196,745	157,411	399,870	66,094	69,893	3,514	171,690	331,853	83.0	68,017	33,489	27,734	95,572
New Orleans & Northeastern	Feb.	204	202,136	14,233	230,017	29,995	36,034	6,243	93,675	178,464	77.6	51,553	21,386	752	64,438
	2 mos.	204	367,637	32,874	429,262	61,846	76,100	13,085	173,157	349,627	81.4	79,635	19,031	—24,762	106,311
Northern Alabama	Feb.	100	47,026	1,055	49,297	11,447	1,252	1,153	14,462	30,721	62.3	18,576	12,857	170	12,262
	2 mos.	100	94,331	2,509	99,498	24,807	2,578	2,373	30,934	65,161	65.5	34,337	22,950	—3,550	23,844
Southern Pacific	Feb.	8,707	7,404,400	1,570,600	9,929,141	1,425,041	1,851,553	318,606	4,597,970	8,938,422	90.0	990,719	—165,137	—798,907	1,367,955
	2 mos.	8,732	15,655,502	3,412,275	21,067,062	2,876,722	3,898,850	665,166	9,673,651	18,696,545	88.7	2,370,517	52,047	—1,218,538	3,390,600
Southern Pacific Steamship Lines	Feb.	....	485,674	21,290	526,808	12,864	103,350	17,078	403,482	555,579	105.5	—28,771	—45,134	—45,195	—5,920
	2 mos.	....	958,929	31,696	1,034,208	34,808	207,417	33,922	817,471	1,129,936	109.3	—95,728	—126,465	—126,778	63,912
Texas & New Orleans	Feb.	4,421	2,819,283	257,302	3,353,256	512,979	663,587	121,725	1,226,926	2,740,183	81.7	613,073	301,698	74,549	556,958
	2 mos.	4,421	5,704,825	570,449	6,841,590	1,041,910	1,349,189	247,181	2,562,837	5,646,991	82.5	1,194,599	569,325	113,129	1,359,939
Spokane, Portland & Seattle	Feb.	947	505,791	29,250	575,415	82,305	83,968	8,826	249,943	450,836	78.3	124,579	61,292	31,927	50,446
	2 mos.	947	1,024,371	65,102	1,172,829	168,097	160,186	19,119	494,019	899,012	76.6	273,817	144,662	81,511	139,157
Tennessee Central	Feb.	287	157,284	3,338	170,166	31,943	26,042	6,848	68,753	144,230	84.8	25,936	14,195	—2,417	29,153
	2 mos.	287	337,618	7,560	364,525	61,302	55,369	12,568	141,954	291,694	80.0	72,831	48,746	15,376	58,683
Texas & Pacific	Feb.	1,937	1,595,848	183,144	1,946,764	200,191	322,731	71,945	700,594	1,409,335	72.4	537,429	388,239	248,653	456,489
	2 mos.	1,937	3,316,083	407,118	4,065,246	418,856	701,654	146,458	1,446,825	2,951,784	72.6	1,113,462	810,920	507,230	848,935
Texas Mexican	Feb.	162	90,390	1,236	102,747	12,812	16,893	3,288	38,116	77,413	75.3	25,334	19,892	15,354	16,141
	2 mos.	162	165,441	1,779	192,118	32,083	32,830	6,904	79,495	164,433	85.6	27,685	14,900	4,518	36,599
Toledo, Peoria & Western	Feb.	239	149,634	1	151,293	29,478	9,057	17,045	39,225	104,602	69.1	46,691	27,366	13,463	33,559
	2 mos.	239	323,716	1	327,753	59,857	18,348	34,312	76,354	208,686	63.7	119,067	72,920	43,274	68,441
Union Pacific System	Feb.	9,912	7,537,379	1,005,625	9,443,208	628,082	1,858,090	295,802	3,606,405	7,040,268	74.6	2,402,940	1,178,329	645,139	641,077
	2 mos.	9,912	15,856,496	2,284,833	20,024,032	1,342,473	3,808,289	636,674	7,772,978	14,930,958	74.6	5,093,074	2,633,441	1,413,421	1,562,480
Utah	Feb.	111	54,132	.....	54,252	8,558	17,739	478	16,691	47,753	88.0	6,499	—2,178	—10,478	11,810
	2 mos.	111	122,578	.....	122,968	19,421	38,207	1,042	39,876	107,403	87.3	15,565	—4,008	—15,456	39,642
Virginian	Feb.	619	1,374,101	2,732	1,434,182	147,077	346,163	22,102	251,590	797,647	55.6	636,535	446,535	498,002	792,482
	2 mos.	619	2,966,881	6,098	3,091,773	291,653	701,738	44,530	535,584	1,633,804	52.8	1,457,969	1,057,969	1,159,062	1,593,638
Wabash	Feb.	2,434	2,476,492	175,069	2,857,456	383,127	583,666	146,365	1,382,226	2,644,292	92.5	213,164	—6,431	—348,356	476,519
	2 mos.	2,434	5,177,739	405,553	6,021,436	767,683	1,194,224	302,066	2,894,081	5,448,624	90.5	572,812	127,515	—577,493	995,727
Ann Arbor	Feb.	294	233,922	2,245	242,442	23,290	61,127	12,882	125,954	234,980	96.9	7,462	—12,006	—28,055	36,506
	2 mos.	294	481,615	5,595	501,237	47,491	124,603	25,926	261,600	483,870	96.5	17,367	—21,440	—50,233	56,219
Western Maryland	Feb.	879	1,030,506	5,233	1,077,433	95,306	254,708	41,362	322,424	757,380	70.3	320,053	235,053	255,601	467,044
	2 mos.	879	2,173,463	11,673	2,267,370	225,081	546,024	79,287	676,874	1,625,379	71.7	641,991	466,991	511,161	925,347
Western Pacific	Feb.	1,208	707,247	18,982	747,488	184,442	224,190	55,165	465,906	993,790	133.0	—246,302	—334,677	—379,050	—22,603
	2 mos.	1,208	1,651,432	44,932	1,740,247	356,413	505,909	113,915	958,383	2,044,070	117.5	—303,823	—485,653	—629,013	42,290
Wheeling & Lake Erie	Feb.	513	608,120	1,581	635,839	62,475	169,768	32,849	280,162	571,233	89.8	64,606	—18,982	29,346	424,011
	2 mos.	513	1,293,047	3,657	1,351,372	147,307	359,920	67,110	591,647	1,218,790	90.2	132,582	—39,056	67,647	778,061